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ABSTRACT

An exploratory study examined influences on secondary and postsecondary vocational and technical student time on task. In conducting the study, researchers recorded minute-by-minute observations of the interactions of 152 secondary students and their teachers and 328 postsecondary students and their teachers in a total of 25 classes that were located in an inner city, its adjoining suburb, and a midsized urban site. An analysis of the data collected during these observations revealed that the secondary students spent 71.4 percent of their time on task, whereas the overall proportion of time spent on task at the postsecondary level was 83.5 percent. The most important teacher behavior relating to student time on task was goal definition. Included among the other teacher-related variables that were closely related to student time on task were planning and organizing, deliberate maximizing of available time, using appropriate teaching methods, and modeling the work ethic. Student grouping turned out to be the most important classroom variable. Based on these findings, recommendations were made for teachers to define goals clearly, consider time an important resource, ensure that students' tasks are meaningful, encourage student independence, and have positive expectations of students. (MN)

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INFLUENCES ON SECONDARY AND POSTSECONDARY VOCATIONAL-TECHNICAL STUDENT TIME ON TASK

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FOREWORD

How students spend their time in school has become a critical issue in education. Research with elementary students and academic high school students indicates that time on task is a key variable in learning. Furthermore, time use is one of the few variables that can be manipulated by teachers. Prior to the time-on-task research conducted at the National Center, only limited information about vocational students' and teachers' use of time was available. This is the second study of time on task in vocational classes. The first provided a database of time use in secondary vocational programs. The current study expands that database by adding postsecondary programs and by focusing on the teacher behaviors and classroom variables that may affect student time on task.

This report is designed primarily for researchers, evaluators, and teacher educators to show how students and teachers spend their time in vocational-technical classes. The report examines the relationships among student use of time, classroom variables, and teacher instructional/managerial behaviors. It should be used to spur continued research in time-on-task issues in vocational classes, to formulate evaluation criteria, and to give information to educators of future vocational teachers.

The study was conducted in nine secondary vocational classes representing agriculture, business and office, and trade and industrial service areas, and sixteen postsecondary vocational-technical classes representing agriculture, business and office, trade and industrial, and technical service areas. Two project staff members observed each class with one observer coding observations every minute and the other writing a narrative account of classroom activities and teacher behaviors.

Although the teachers and other school personnel who participated in this study must remain anonymous, we want to thank them for letting us collect the data in their classrooms. Special appreciation is extended to Dr. Lorin Anderson, University of South Carolina, and Judy Pfannenstiel, Research Management Corporation, for meeting with us and sharing their expertise.

This project was conducted in the Evaluation and Policy Division of the National Center under the direction of N. L. McCaslin, Associate Director. We wish to thank Ida Halasz, Project Director; Karen Behm, Graduate Research Associate; and Marta Fisch, Programmer, for preparing this report. Also thanks to Floyd McKinney, Stephen Franchak, and Pat Fornash for all the hours they spent collecting the data. We appreciate the statistical analysis help provided by Paul Campbell, John Gardner, and Prem Goel, and the many hours of typing done by Marjorie Arnold, Priscilla Ciulla, and Deborah Anthony. Editing was provided under the supervision of Janet Kiplinger.

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Robert E. Taylor
Executive Director
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in Vocational Education

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EXECUTIVE SUMMARY

Time on task is one of the most critical variables associated with student productivity and learning in school. Numerous studies have supported the commonsense notion that time on task, or the time when students are engaged actively in learning activities, relates positively to academic achievement. More important, time use is one of the few variables related to achievement that can be manipulated to some extent by teachers. Most previous time-on-task studies were conducted in academic classes, producing results specifically relating to elementary and high school English, math, or science classes. While these results provided valuable insights, they were not specific enough for the unique learning activities in vocational-technical education classes.

Consequently, the National Center has conducted two consecutive studies to determine how time is used by vocational-technical students and what their teachers do to maximize time spent on curriculum-related tasks. The first study that resulted in a report entitled Time on Task in Selected Vocational Education Classes (Halasz and Behm 1983) determined how time was spent in secondary classes. The current study has extended the scope of that effort by including the following purpose:

> To investigate the relationship of teacher instructional/managerial behaviors and classroom variables to students' time on task in secondary and postsecondary vocational-technical classes.

In conducting the study, the following methodology was used. Nine secondary and sixteen postsecondary classes were selected purposively for participation in this exploratory study. The classes were located at two geographic sites, an innercity and its adjoining suburb and a midsized urban site. The secondary classes were in two comprehensive high schools and five area vocational schools, while the postsecondary classes were in a community college and an adult technical school. Altogether, 152 secondary and 328 postsecondary students were observed for 5,938 and 5,915 minutes respectively.

The minute-by-minute observations were recorded on two types of observation guides, one of which was also used to record narrative data. Student time spent on specific content or non-content tasks, on breaks, and off task were recorded along with grouping, interruptions, and disruptions. Teacher methods, level of with-it-ness (sensitivity to students' needs), types of interaction, goal definition, organization, role modeling, and other variables were also recorded.

The data from the secondary and postsecondary classes were analyzed and reported separately because the student levels of maturity and motivation differ considerably. The proportions of time on and off task were calculated by dividing the number of student minutes spent on the activity by the total number of students present in the class. The primary data analysis was conducted by computing means of proportions of time and breaking them down by the explanatory variables. Analysis of variance was used to test statistically significant differences. All analyses were done for the full sample and replicated for each service area. The narrative data were synthesized and analyzed with qualitative methods.

The findings and conclusions of the study indicated that the overall proportions of time spent by secondary students were 71.4 percent on task (basic skills, 2.8%; employability skills, .7%; theory, 21.3%; practice, 37.8%; noncontent, 8.5%) and 29.6 percent off task (breaks, 4.5%; and time socializing, waiting, other off task, 24.1%). There was considerable variation in time use among the three service areas--agriculture, business and office, and trade and industrial and among the classes within them.

At the postsecondary level the overall proportions of time spent were 83.5 percent time on task (basic skills, .3%; employability skills, 1.6%; theory, 42.3%; practice 27.9%; and noncontent, 11.4%) and 16.5 percent off task (break, 7.3%; and other off task, 9.2%). Again, the four service areas--agriculture, business and office, trade and industrial, and technical--differed from each other in the use of time.

The same variables were investigated in both the secondary and postsecondary classes with somewhat different results. The findings and conclusions were stronger at the secondary level because the range of time on task (44.8% to 95.9%) was much greater than the range in postsecondary classes (78.1 to 90.3%).

The most important teacher behavior related to student time on task was goal definition. Teachers who clearly stated goals to be accomplished had the highest proportion of student time on task. This variable was closely tied to teacher planning and organization, which was also a very important factor. Another related variable was the teacher's deliberate maximizing of the available time.

The use of the appropriate teaching methods was critical to student time on task, especially in secondary classes. One-to-one instruction prevailed, with about a third of teacher time on that method. This method facilitated time on task when the teacher was tuned in to other students' needs at the same time. Test/inspect work in progress and discussion were more conducive to student time on theory, while observation was more conducive to time on practice. Secondary students required much closer supervision through interaction and observation than did postsecondary students. In fact, in postsecondary classes, students had a greater proportion of time on task when teachers were out of the room or doing their own work. The teacher method least conducive to student time on task was clean up or setting up. Teachers who used different teaching methods elicited a greater proportion of time on task than those who only used a few teaching methods.

Other teacher variables that appeared to relate positively to student time on task were modeling the work ethic and providing real world-of-work examples, having positive expectations of the students, and positively reinforcing students. While the teacher variables differed somewhat in magnitude or priority between the secondary and postsecondary classes, they were all influential at both levels.

The most important classroom variable was student grouping--whether students were located in one or more rooms and whether they were engaged in one or various tasks. This variable was strongly related to what methods the teachers used, what level of with-it-ness was necessary, and what type of interaction/observation was required. Most secondary students were located in more than one room and worked on more than one task, while most postsecondary students were in one room and worked on one task. Thus, teacher control or opportunity to keep students on task was less at the secondary level.

While interruptions did not significantly reduce time on task for all students, they did distract the individual students who were interrupted by, for example, other students who came into the class to chat with them. Overall, disruptions were minimal and did not appear to make much of a difference.

There were a number of implications from this study for vocational educators. There are several recommendations for increasing student time on task. Especially in secondary classes, but also in postsecondary classes, teachers should--

- define goals clearly
- consider time an important resource

- ensure that students' tasks are meaningful
- improve and diversify teaching methods
- decrease time for breaks
- decrease interruptions of individuals
- encourage student independence
- have positive expectations of students
- provide positive reinforcement
- serve as a role model of good work habits

As exploratory research, this study raised many questions that could not be answered. More research is needed to test the conclusions and to extend the scope of this study. Further research is recommended in several areas, including--

- studying within each service area and specific classes,
- correlating vocational-technical achievement to time on task,
- coordinating vocational-technical teacher education with time-on-task research, and
- developing criteria for evaluation based on time-on-task research.

It is also recommended that since time on task is such an important variable, research should be continued in this area to further build a useful database for researchers and practitioners.

CHAPTER 1

INTRODUCTION AND FRAMEWORK

Organization of the Report

This report provides detailed descriptions of the research methodology and findings from an exploratory study. The study investigated the relationship of teacher instructional behaviors and classroom variables to student time on task in secondary and postsecondary vocational-technical classes. The people for whom this report is intended are teacher educators, researchers, and evaluators at state departments of education, colleges and universities, two-year postsecondary schools, and large local education agencies. This report is intended to be used as a basis for future research of time on task in vocational classes at the secondary and postsecondary levels. It is also intended to be helpful in developing criteria to evaluate vocational programs and teachers, and to provide recommendations to educators of future vocational teachers.

The first chapter contains background information, including the purpose, objectives, and questions of the study; definitions of terminology used in the study; assumptions and limitations. The second chapter synthesizes the findings from previous studies and provides a matrix to compare key studies. In the third chapter, the details of designing the observation guide, selecting the sample of classes for observations, and data collection and data analysis are discussed. Chapter 4 provides the results and conclusions that are discussed separately for secondary and postsecondary classes. The last chapter summarizes the study. Policy implications and recommendations as well as recommendations for further research are offered. The appendix includes the observation guides.

Overview

Time on task is one of the most critical variables associated with student productivity and achievement in school. The time during which students are actively engaged in learning activities is called time on task (Bloom 1977). The National Commission on Excellence in Education (1983) has successfully raised public and educational interest in the efficient use of time available for learning in school. Numerous studies have investigated the differences in time use and the consequences of on- or off-task time in many types of classes (i.e., Evertson 1980; Fisher et al. 1978; Rosenshine 1981; Stallings and Mohlman 1981).

Results from the studies are not consistent, but strongly support the commonsense idea that time use is an important variable. More important, perhaps, time use is one of the few variables related to achievement that can be manipulated by teachers and administrators (Karweit 1983). In light of the many variables affecting school-related achievement that cannot be manipulated to any significant degree by educators, it is reasonable that educators focus on increasing time on task as one way to improve the productivity and quality of school learning.

The systematic study of teacher behaviors related to time on task is a relatively recent development in educational research. Only during the past decade have studies identified the impact of teaching methods on student time use and student achievement in learning. Findings from the seminal study by Fisher and his associates (1978) indicate that some teaching behaviors (i.e., spending a large amount of time talking with students about class work) are positively associated with efficient use of student time and student achievement.

The majority of time-on-task research, including those studies regarding teacher behaviors, has been conducted in elementary or secondary academic classes. Prior to the first National Center study of time on task in vocational education, (Halasz and Behm 1983), there were little data indicating how students and teachers use time in various types of vocational education classes. That study provided much-needed baseline data on time use, showed that time use varies considerably among different classes, indicated that observation methods can be used to collect reliable data in vocational education classes, and showed that teachers control most of the ways students spend class time. Another finding was that administrative decisions such as the length of classes and the number of students in classes also influence students' use of time in vocational classes. Longer classes and smaller classes had a higher proportion of time on task than did shorter classes and classes with more students.

Purpose and Objectives

This report describes the second study conducted at the National Center to investigate time on task in vocational-technical classes. This study, like its antecedent, is exploratory in nature. It will not provide data applicable to all secondary and postsecondary vocational-technical classes. The purpose of this study is to investigate the relationships of teacher instructional behaviors and classroom variables to students' time on task in secondary and postsecondary vocational-technical classes and to guide future evaluation efforts.

The findings from this study are useful as a source of previously undiscovered information about the relationship of teacher and classroom variables to secondary and postsecondary vocational-technical students' productivity. They can be used in preservice and inservice teacher education curricula, and can provide criteria for evaluating the productivity of vocational-technical education classes. The specific objective of this study was to identify the teacher instructional/managerial behaviors and classroom variables that increase student time on relevant tasks in secondary and postsecondary vocational-technical classes.

Questions

To support the objective of this study five questions were asked:

1. What are the characteristics of the classes in the study?
2. What are the proportions of time spent by students on task, on breaks, and off task?
3. What are the relationships of teacher instructional and managerial behaviors to student time on task?
4. What are the relationships of classroom variables to student time on task?
5. What is the relationship among student use of time, teacher instructional/managerial behaviors, and classroom variables?

Definitions

Many terms have been used in studies about time and education. The following terms are defined as they are used in this study.

Observation Guides

Observation guide is the instrument used to record every minute of student and teacher activities in vocational-technical education classes. Two different types of observation guides were used in this study. The first, Observation Guide I, was used to record the number of minutes students spent on various tasks and off task; the amounts of time teachers spent upon various instructional behaviors; and classroom variables. The second, Observation Guide II, was used to record teacher with-it-ness, disruptions, interruptions, transactions, and a narrative describing teacher-student interactions. (Both guides are included in the Appendix.)

Classroom Variables

Disruptions are those disturbances or activities that arise within the classroom and temporarily stop or decrease student time on task. An example is when students in the class talk too loudly and are reprimanded by the teacher.

Interruptions are those disturbances that originate outside of the classroom and temporarily stop or decrease student time on task. An example is when announcements are made over the public address system.

Grouping is a combination of two sets of variables used in Observation Guide I. Through chi square analysis, the student dispersement and grouping codes were combined to form the following four types of groups:

Group 1. Students are in two or more connecting rooms and are working on various tasks individually or in small groups.

Group 2. Students are in one room and are working on various tasks individually or in small groups.

Group 3. Students are in two or more connecting rooms but are working on one task as a class.

Group 4. Students are in one room and are working on one task as a class.

Curricular Contents

Technical skills are the hands-on performance (practice), or the learning about (theory) those tasks of varying levels of skill that require proficiency, ability, or dexterity for complex, or highly complex cognitive understandings. Examples of technical skills are occupation-related knowledge of procedures and the use of tools, equipment, and facilities.

Basic skills are also considered to be a part of the curriculum. They may be defined as the use of reading, mathematics, and both oral and written communications skills by students in vocational-technical education classes (adapted from Weber 1982). Examples of basic skills are calculating, writing, speaking, and reading, in conjunction with technical skills.

Employability skills include the three areas of work attitudes or values: job-seeking, maintaining, and advancing skills; and knowledge of the world of work. These three areas were ultimately combined for analysis in this study because a relatively small proportion of time was spent upon them in the classes observed for the previous study. Examples of the first of these three areas, work values or attitudes, are getting to class or work on time and doing one's work well. Examples of the second one, job-seeking, maintaining, and advancing skills, include developing a resume and learning about interpersonal skills that are necessary for success on the job. Examples of knowledge of the world of work activities are discussions about job opportunities, wage structures, and the social or personal implications of chosen jobs.

Time

Total class time is the largest unit of time considered in the study. Total class time is the amount of time, in minutes, that is officially scheduled for a particular vocational-technical class.

Time on task is the proportion of time students are attending to teacher-assigned activities. Time on task includes curricular content, both practice and theory, and noncontent activities.

Time on content is the proportion of time students are engaged in basic skills, employability skills, the practice or theory of technical skills, and youth organization skills.

Time on noncontent includes the proportion of time students are setting up, cleaning up, and doing other assigned but noncurricular content activities.

Time on break is the proportion of time students are on scheduled or mandatory breaks. Other time used by students for restroom visits, getting a drink, or other breaks from classwork is considered time off task.

Time off task is the proportion of time students are not on curricular content, are on assigned noncontent, or are on scheduled breaks. Time off task indicates the students are waiting, doing nothing, socializing, goofing off, using the restroom, and so forth.

Time on practice is the proportion of time students are engaged in using technical skills through hands-on practice or work with tools, equipment, and materials.

Time on theory is the proportion of time students are engaged in using technical skills through discussions, lectures, tests, workbook exercises, and so forth.

Other Definitions

Engagement occurs when students are actively involved in learning, whether it is theory or practice. In an observation study, engagement is assumed from what students appear to be doing. There is not way, however, to assess the quality of the students' work.

With-it-ness was coined by Kounin and Gump (1974) to identify teacher behaviors which communicate that the teacher knows what is going on in the classroom at all times.

Assumptions

Five major assumptions were made in conducting this study. These assumptions were based upon a thorough review of related studies, theoretical models, information provided by acknowledged experts in time-on-task research, and procedures and findings from the previous study by Halasz and Behm (1983). First, it was assumed that the results of studying teacher instructional/managerial behaviors relating to student time use can contribute relevant information for improving vocational-technical education. Second, it was assumed that student time on task is a critical variable for achievement in school learning. Third, it was assumed that while no agreement exists about the desirable outcome of secondary and postsecondary vocational-technical education, there are tasks (or curricular content areas) that most educators would agree should be addressed in all vocational-technical education programs. Fourth, it was assumed that the differences between secondary and postsecondary vocational classes require separate analyses of the data. Fifth, it was assumed that the findings and observation methodology developed for and tested in the previous study can yield useful data to help study the relationships of teacher behaviors to student time use.

First Assumption

Studying teacher instructional/managerial behaviors relating to student time use can produce information to improve vocational-technical education in several ways. The procedures and findings are useful for developing criteria to evaluate programs, which will accurately reflect what actually happens in the classroom to produce learning. Consequently, recommendations resulting from evaluations can direct teachers and administrators to make changes more effectively in areas that have been shown to make a difference and that they can control.

Results of this study also can improve vocational-technical education by providing information to teacher educators, school administrators, program supervisors, and teachers. Knowledge of the relationship of teacher behaviors to student time use can shape or change teachers' instructional styles to maximize student time on task.

Second Assumption

Student time on task is a critical variable for achievement in school learning. Evidence from a substantial body of research indicates that time spent on relevant tasks, also described as productivity or student engaged time, increases student opportunities to learn. Chapter 3 describes related studies which indicate that various measures of time have been studied as variables of school learning for almost a century. The conclusion from the various studies is that the time spent in school on relevant tasks is positively correlated with increased student learning and achievement. Although many studies have been conducted in elementary and academic secondary classes, very few have addressed time on task in secondary vocational education and none have addressed time on task in postsecondary vocational-technical classes.

Third Assumption

There are certain tasks (or curricular content areas) that most educators would agree should be addressed in all vocational education programs. Although there is a lack of agreement about the desired outcomes or goals for secondary programs (McKinney et al. 1981), there appears to be agreement about a core of tasks that should be addressed (Kazanus 1978; Selz 1980). These include (1) basic skills; (2)employability skills that subsume knowledge of the world of work; (3) job-seeking, maintaining and advancing skills; (4) work attitudes or values; (5) technical skills, which are either theoretical or practical; and (6) youth organization activities.

Similarly, at the postsecondary level there is no core curriculum taught in all service areas, although there is somewhat more agreement about the goals of postsecondary education (McKinney et al. 1982). In order to determine which specific tasks are addressed at the postsecondary level, the same broad group of tasks used for the secondary observations was used for the postsecondary observations. It was believed, however, that there would be less emphasis upon basic skills and youth organization activities than at the secondary level.

Fourth Assumption

There are differences between secondary and postsecondary classes that make separate analyses of the data necessary. Although secondary and postsecondary classes frequently have the same course and program titles, the motivation of the students to attend these classes may differ considerably. Secondary students, for the most part, are required to be in school. Even if they elect a vocational-technical class, it may not be their choice to be in school at all. In addition, many secondary vocational students are in their second- or third-choice program area. In contrast, postsecondary students elect to attend a specific school, choose the program area, and often choose a specific teacher. Postsecondary students frequently must pay for their schooling, whereas secondary students rarely pay for anything except consumable materials for projects and an occasional tool. Also, some postsecondary students are forfeiting the opportunities to earn money in a job while they are attending school. The differences in the right to choose, the sacrificing of paychecks, and the need to pay for classes are coupled with differing levels of maturity of the students. Secondary vocational students are fourteen to seventeen years old as opposed to postsecondary students who have a median age of twenty-seven (McKinney et al. 1982). As a result of these differences, it is reasonable to assume that secondary students have a less self-motivated and less task-oriented approach to their vocational courses. Conversely, postsecondary students would appear to have a more self-motivated and task-oriented approach because they are older, have better defined employment-related goals, and have a greater investment of time and money in attending their classes.

Fifth Assumption

The findings from the previous study as well as the observation methodology developed and tested in that study provide a foundation for the current study. The findings from the previous study indicated that the designated tasks (curricular content areas) were indeed addressed in secondary vocational education classes. The findings also confirmed that teacher methods in vocational classes are different than those reported in studies of academic classes.

Findings from the observation methodology indicated that activities could be recorded reliably on a minute-to-minute basis. They also showed that there was a high degree of agreement among observers using the observation guides. The correlation coefficients were employability skills--.73; set up/clean up--.77; off task--.90; basic skills--.94; and technical skills--.94, for coding the various tasks. Flanders (1967), who is perhaps the best-known classroom observer, feels that a coefficient of .85 is a reasonable level of correlation among observers. The results of the interrater reliability assessments in the previous study compared favorably with those of .44 to 1.00 reported by Stallings (1977) and .79 and .80 reported by Sirotnik (1982) for their respective studies.

Limitations

This study is the second conducted by the National Center for Research in Vocational Education to investigate the use of time in vocational-technical classes. The first study was exploratory in that it aimed to develop strategies to study time-on-task issues and develop baseline data on time use through the use of observation methodology. Although that methodology has been refined, a limitation is that it remains an exploratory study. The observation guides should be considered to be in a developmental state. A number of new variables have been added to the observation guides in the current study to collect data for determining the relationship of teacher and classroom variables to student time use.

A second limitation is the lack of generalizability to the population through sampling. The nine secondary and sixteen postsecondary classes that participated in the study were selected deliberately rather than randomly. The classes were selected to represent a cross-section of vocational classes in several service areas. Despite the intensive observation required to collect the data, the study included a large sample of twenty-six teachers and over four hundred students.

A third limitation of the study is the lack of generalizability to the total school year of activities. The time of the year when the observations were made is not necessarily representative of how time is spent throughout the September-through-June school year. Because of scheduling constraints, the observational data were collected during March and April, which are close to the end of the school year. Several teachers cautioned observers that much of the theoretical work had already been done earlier in the year and that more students were working on individual projects at that time than during the previous months. While the results of the previous study indicated no significant differences among weeks observed in March and April, it is possible that there would have been significant differences among weeks observed in September, December, April, and June.

With these limitations in mind, the reader should be careful to avoid applying the results of this study to all secondary and postsecondary vocational classes in general. Vocational-technical education is extremely diverse, with considerable variance among communities, schools, governance structures, populations served, and goals. Within its limits, this study provides an unprecedented amount of data about the relationship among teacher instructional/managerial behaviors, classroom variables, and student time on task in a number of secondary and postsecondary vocational-technical classes. Not only does this information increase the understanding of the productivity and the dynamics of vocational-technical classes, it also provides data for developing evaluation procedures incorporating time on task as a criterion.

CHAPTER 2

REVIEW OF RELATED STUDIES

Antecedent Study in Vocational Classes

Studies of classroom time have evolved from gross measures of the length of the school year, to measures of time allocated to a subject, to the actual time students spend on specific tasks. The most recent time-related studies have their origins in the process-product studies of the 1960s and 1970s. These studies related classroom processes or practices to educational products, such as student achievement. Numerous studies were conducted in various stages to discover which classroom practices lead to student achievement. Initially the studies focused upon time spent on basic skills in elementary schools and have since evolved to include a variety of academic subjects such as English or math in secondary schools (Stallings 1980).

Time on Task in Selected Vocational Education Classes (Halasz and Behm 1983) was one of the few studies of time on task conducted in secondary vocational education classes. The purposes of that exploratory study were to develop appropriate observation procedures for recording student time use in vocational classes and to determine the proportion of time spent upon curricular content. The results of the study provided a reliable observation guide and baseline data about student and teacher time use in purposively selected secondary vocational classes.

Briefly, the data from that study indicated that the average proportions of time spent by the students in the ten classes observed for ten class periods each were

Basic skills 6.74% Technical skills 41.17% (practice and lecture) Employability skills 7.99%	55.9% On task/content
Set up/clean up 7.18% Related/on task 6.07%	13.25% On task/ noncontent
Off task/socializing 25.27% Break 5.67%	30.94% Off task

The proportions of student time use varied greatly among the individual classes and from day to day in the same class. Figure 1 shows how time on task varied day to day during one week of observation in a distributive education class. The amount of time students were absent or late also varied considerably among classes and from day to day. The average rate of absence was 18.4 percent. There were significant differences ($p<.001$) for the proportions of time on task among short (46 to 56 minutes), medium-length (111-126 minutes), and long (146-176 minutes) classes. Long classes had a significantly ($p<0.05$) higher proportion of time in class than medium-length classes, and medium-length classes had a significantly higher proportion than short classes.

Medium sized classes (15-17 students) had a significantly higher ($p<0.01$) proportion of time on task (74 percent) than larger classes (24-26 students, 59 percent). The smallest class (7 students), which was not included in the calculations, had the highest mean (86 percent) of time on task.

A significant difference ($p<0.05$) was found for time on task between classes that had a substitute teacher as opposed to the regular teacher. There was a higher proportion of time spent on task when the regular teacher was present, even when the substitutes appeared to be task oriented and conscientious. Teachers spent, on the average, over a fourth of their time (29 percent) providing one-to-one instruction. They worked at their desk 11.8 percent of the time, observed students at work 8.1 percent, gave directions 8.8 percent, and lectured 8.3 percent.

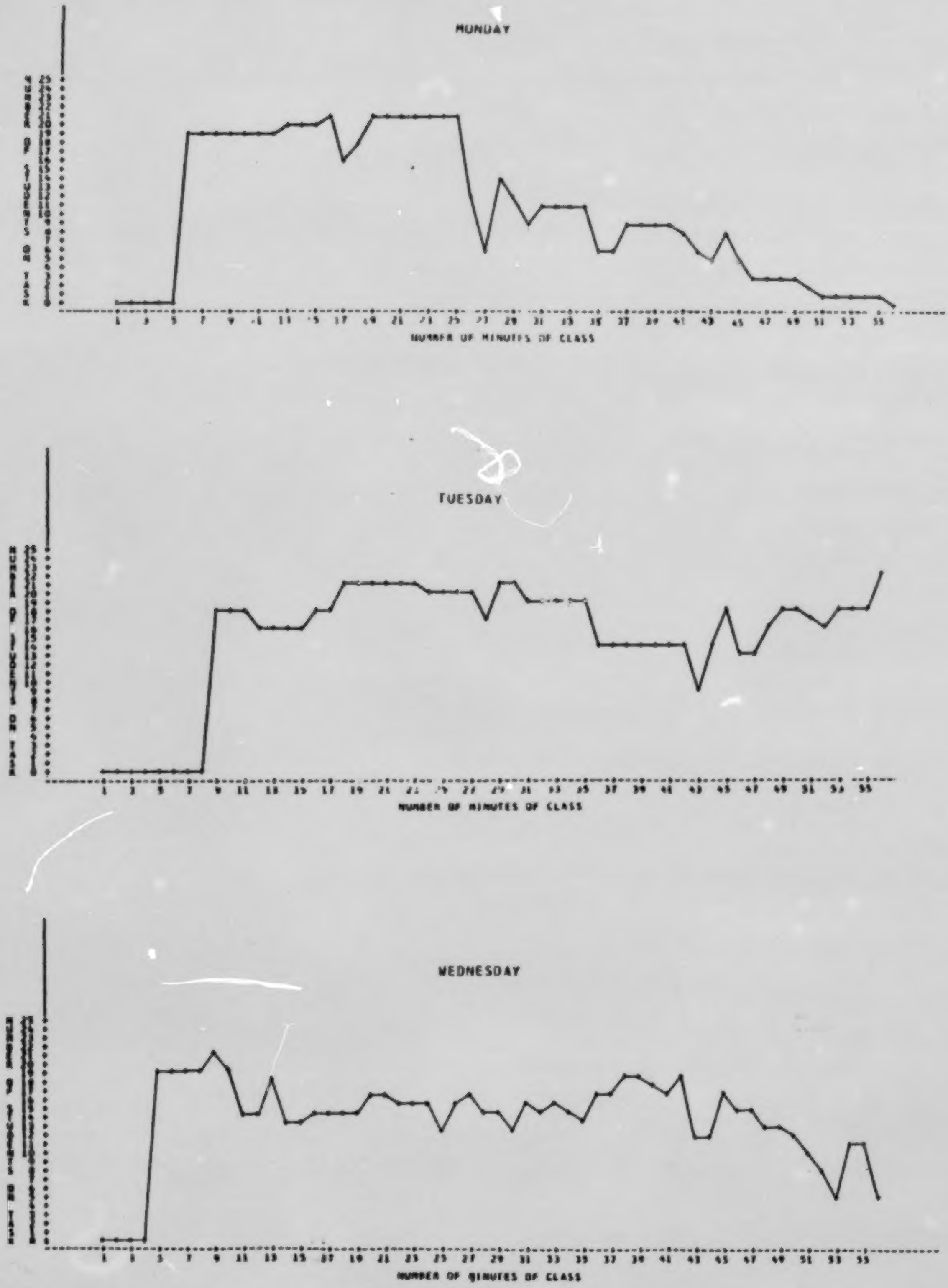
The proportions of time on task in this study appeared to be similar to those found in studies conducted in academic subject classes. Because of the diversity in research objectives and procedures, however, further comparisons could not be made between vocational and academic subject time-on-task studies. This study provided a database of student time use, and, to a limited degree, teacher time use in ten purposively selected secondary vocational classes.

Recommendations for further research emphasized the need to determine the relationships of teacher instructional/managerial behaviors to student use of time. As a result, a second study has been conducted to investigate the relationship of teacher behaviors, other potentially viable variables, and student time use in vocational-technical classes.

Comparison of Related Studies

Although numerous studies have been conducted on time on task, especially in elementary classes, methodology and definitions of on-task behavior vary. According to a summary of research by Caldwell, Huitt, and Graeber (1982), studies at the secondary level have found much higher student engagement rates than those at the elementary level. There is some belief that

FIGURE 1. STUDENTS ON TASK EACH DAY
OF ONE WEEK IN A DISTRIBUTIVE EDUCATION CLASS



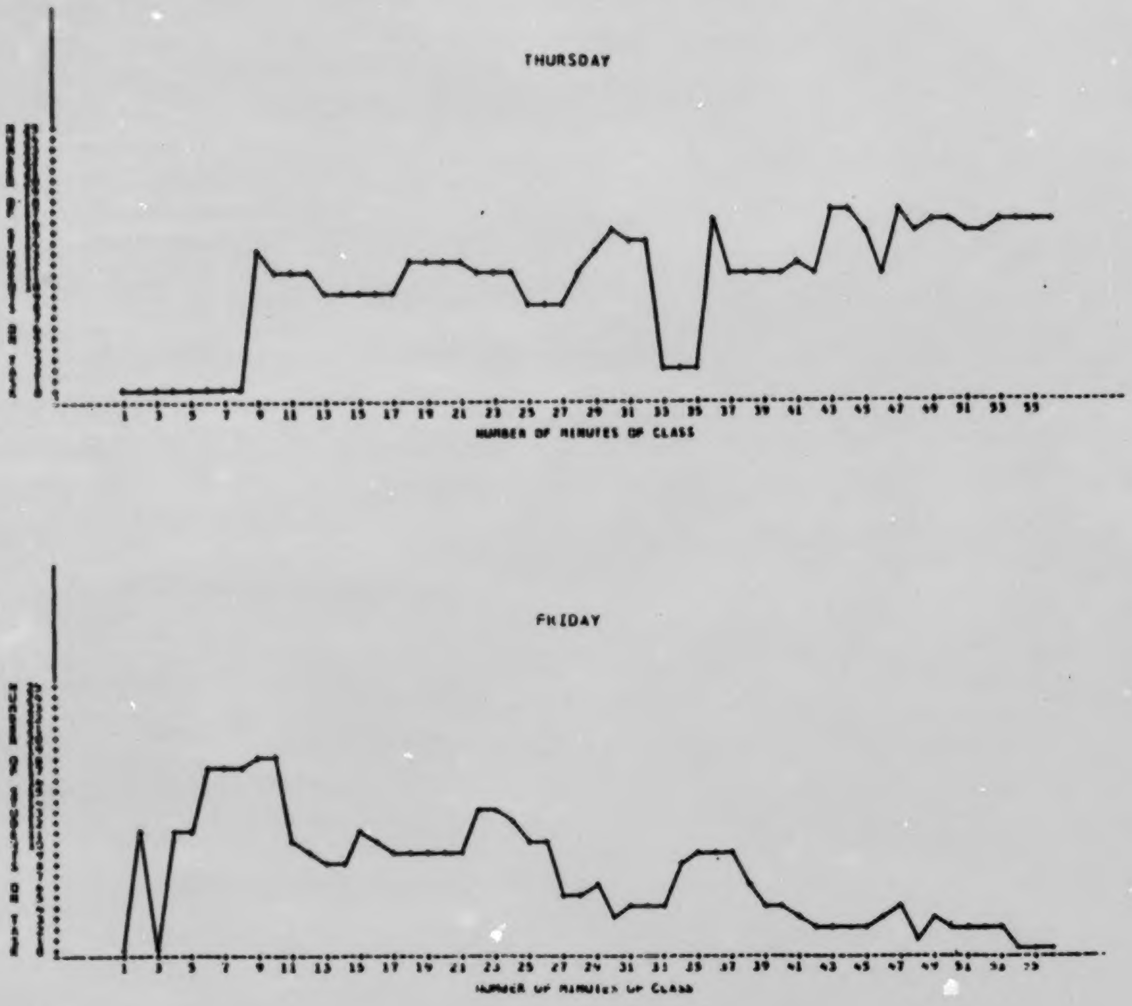


Figure 1. Continued

secondary students may mask their nonengagement behaviors more effectively than elementary students. As in the elementary studies, it is difficult to compare engagement rates across studies, particularly since some results come from early work on the amount of time students paid attention to tasks. Studies before 1950, for example, found engagement rates of 90-98 percent (Blume 1929) and 80-88 percent (Edminston and Braddock 1941). Later studies found engagement rates of 62-83 percent (Anderson 1975), 84-92 percent (Frederick et al. 1979), and 40-85 percent (Evertson 1980). In Evertson (1980) the average for high-chieving students was a 40 percent engagement rate.

Several factors affect the differences in engagement rates between studies. Engagement rates are usually calculated as a percentage of allocated time. However, some studies (Fisher et al. 1978) excluded general management activities and transition time, such as handing out assignments, from allocated time. Other studies, (Brady et al. 1977) included such activities. Noncontent activities assigned to students, such as students putting their name on assignments, were considered on task in some studies and off task in others.

The following matrix, table 1, lists several time-on-task studies and their major findings. Methodology and terminology varied considerably among the studies, which renders direct comparisons of results impossible. Together, however, the studies provide an overview of how time use in the classrooms has been observed by other researchers.

Early Models of Time and Learning

Most of the time-related studies trace their theories about time to Carroll's (1963) model of school learning. The fundamental tenets in his model are that time is a critical variable in individual student learning and that students differ in the amount of time they need to learn a given unit to a set level of proficiency. Carroll's model includes the five factors of aptitude, ability, perserverance, opportunity to learn, and quality of instruction, reduced to the following formula:

$$\text{Degree of Learning} = f\left(\frac{\text{time actually spent}}{\text{time needed}}\right)$$

Carroll distinguished between elapsed time and the time the learner is actually spending on the act of learning as the time during which the learner is paying attention and trying to learn.

TABLE 1

COMPARISON OF TIME-ON-TASK STUDIES

Study/Report	Reference	Population	Procedures	Highlights
"A Model of School Learning"	Carroll, J. *Teachers College Record* 64 (1963): 723-733	6th graders	Programmed-instruction booklet developed to teach rules of an artificial foreign language.	Poor quality instruction retarded the learning rate of children of all IQ levels. It also affected perseverance of high-IQ children but had no significant effect on those with IQ's of 115 or below.
Discipline and Group Management in Classrooms	Kounin, J. S., NY: Holt, Rinehart, and Winston, 1970	Book includes a variety of studies. The Dimensions of Classroom Management Study used videotapes of elementary classrooms which also included a few emotionally disturbed children. Behavior of preselected children coded every 10 seconds during academic activities. When possible, preselected children included 8 emotionally disturbed and 8 nondisturbed children.	A second videotape study used 50 first and second grade classroom for a full day. 24 classes were in a suburb of Detroit and 26 in Detroit. Preselected children were coded for work involvement and deviance every 12 seconds. Teacher behaviors were coded separately.	Both effective and ineffective teachers handled distruptions similarly. Effective teachers prevented disruptions from occurring in the first place.
"Relationship of Discrete Classroom Behaviors to Fourth-Grade Academic Achievement"	Cobb, J. *Journal of Educational Psychology* 63 (1972): 74-80	102 fourth graders in 5 classrooms in 2 middle-class schools over 9 days	Observers coded 13 categories of on and off task behaviors.	Best predictor was proportion of time pupil was attending. Other on-off-task variables were also predictive of academic achievement.
Inside High School	Cusick, P. NY: Holt, Rinehart, and Winston, 1973	1 high school	Mainly based on qualitative data--interviews and observations--no formal definitions of behaviors or time.	High school students spent approximately 3 hrs/day on noncontent and approximately 1 1/2 hrs/day on content.
"Time and Learning"	Bloom, B. In *Learning and Instruction*, Wittrock, ed. Berkeley, CA: McCutchan, 1977, 586-597	Synthesis of existing studies of time and learning		Engagement rates were highly predictive of student achievement-accounting for as much as 3/5 variation in achievement.
"The Use of Classroom Time in High Schools Above or Below the Median Reading Score"	Frederick, W. *Urban Education* 11, no. 4 (1977): 459-464	184 classrooms in 27 Chicago public high schools; 12 schools were above median reading score, 15 were below	Every 5 minutes observers recorded the percentage of students present who were involved in the lesson. Interruptions, attendance and completed homework assignments were also recorded.	High-achieving schools had significantly better attendance, a higher level of involvement, fewer students going in and out, fewer interruptions, and more students doing the assigned homework than did low-achieving schools. High-achieving schools had about 75% of classroom time available for instruction, low-achieving schools had 51% of the time available.

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TABLE 1
(continued)

Study/Report	Reference	Population	Procedures	Highlights
Instructional Dimensions Study	Brady, M; Clinton, D; Sweeney, J.; Peterson, M; and Poyner, H. Washington, DC: Kerschner Associates, 1977.	elementary students	Classroom observation with transition time, down time, and management time included as allocated time	Average engagement rate for reading and math was about 60%*
"The Relationship Among Teaching Methods, Student Characteristics, and Student Involvement in Learning"	Anderson, L., and Scott, C. *Journal of Teacher Education 29, no. 3 (1978)*: 52-57	100 nine through twelfth graders in a suburban high school; 15 students each from 7 humanities and social studies classes	Anderson's observation schedule to determine task-relevant behaviors. Classroom behavior of each student was coded once every 90 seconds by two observers. Verbal subtest of Lorge Thorndike Intelligence test used to measure scholastic aptitude. Scott Academic Self-Concept scale used to measure self-concept.	Students with low aptitude and low academic self-concept appear most affected by the variations in teaching methods. Students with high aptitude and high academic self-concepts were more off task in group setting than with other methods. More students, regardless of groups, tended to demonstrate task-relevant behavior when classroom discourse teaching methods were used. Major Findings--different students tend to benefit from different teaching methods.
Teaching Behaviors, Academic Learning Time and Student Achievement: Final Report of Phase III-B. (Beginning Teacher Evaluation Study)	Fisher, C., et al. Technical Report V-I. San Francisco: Far West Laboratories, 1978.	Elementary and secondary students	Classroom observations. Transition time, down time, and management time *not* included as allocated time.	Average engagement rate for reading and math 75%. Engaged time positively related to total reading achievement scores in second and fifth grades; to total math achievement scores in fifth grade.*
Training of Teachers Using Observation of BTES Variables	Brown, R. Washington, DC: National Institute for Education, 1979.	Same as above	40 classrooms observed by 20 student teachers.	Ceramics students were engaged 60% of the time; welding 62%; Biology 44%; English 87%; Music 54%; Woodshop 95%.
15,000 Hours: Secondary Schools and Their Effects on Children	Rutter, M. et al. Cambridge, MA: Harvard University Press, 1979.	12 London inner-city secondary schools	Qualitative Study - narrative descriptions from observations and interviews.	Children's classroom behavior was better in lesson-oriented structured classroom. Pupils attending 75% or more of the time had higher exam scores.
"Time, Teacher Comments, and Achievement in Urban High Schools"	Frederick, W.; Walberg, H.; and Rasher, S. *Journal of Educational Research 73, no. 2 (Nov/Dec 1979)*: 63-65	Secondary students in 175 classrooms in 26 Chicago high schools.	Observations of time usage and teacher's behavior every 5 minutes for 2 periods. A running log also kept.	46.5% of the time was lost due to absences, lateness, inattention.

* Figures for comparison purposes in Caldwell, Huitt, and Graeber. "Time Spent in Learning: Implications from Research." *Elementary School Journal* no. 5 (1982): 471-480.

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TABLE 1
(continued)

Study/Report	Reference	Population	Procedures	Highlights
"A Study of Schooling" (numerous articles have been published from this study)	Reported by K. Sirotnik in "Contextual Correlates of the Expenditures of Classroom Time on Instruction and Behavior: An Exploratory Study of Secondary Schools and Classes" in AERA Journal 19, no. 2 (Summer 1982): 275-292	362 junior high students and 525 senior high students selected from a purposive sample of 25 schools across the nation	5 minute interaction frames were used. 4-5-minute intervals evenly spaced during class period for 3 full periods.	In secondary classes grouping styles with students working alone less often and students in the upper tracks had more time on instruction. Association between most teacher variables and percent of class time spent on instruction and behavior either nonexistent or weak.
"A Study of Schooling Curriculum"	Klein, M.; Tyle, K.; & Wright, J. Phi Delta Kappan (Dec. 1979): 244-248	1064 teachers at 25 junior and senior high schools in 8 subject areas. Also did similar study with elementary classes.	Compared teacher interviews with observed data. Observers were present in 1016 sampled classes. Four 10-minute observations made in each class on 3 separate days.	Teacher perceptions of time on instruction = 70%, observation = 75%, perceived time on routine = 13%, observed = 20%, perceived time on behavior = 12%, observed = 4%
"Instructional, Context, and Individual Differences in Pupil Involvement in Learning Activity"	Cornbleth, C. and Korth, W., paper presented at AERA, San Francisco, 1979 (ED 171 409)	2 high- and 2 low-achievement students in 4 urban fourth grade classrooms	Individual behavior coded minutes by minute	Students engaged 67% time but varied significantly with subject. More allocated time in math/reading but less on task than social studies and science
School Policy, Leadership Style, Teacher Change, and Student Behavior in Eight Schools	Stallings, J., and Mohlman, G. Mountain View, CA: Stallings Teaching and Learning Institute, 1981	8 secondary schools in the San Francisco Bay Area, 43 teachers' classrooms	Observations of classrooms, questionnaires, interviews, review of existing school data, verbal interaction of teachers coded every 5 minutes	Schools where policies and rules clear and consistently enforced had higher teacher morale, fewer intrusions, less litter and vandalism, a lower absence rate, less class misbehavior, and more time on task.
"How Time Is Spent in Elementary Classrooms"	Rosenshine, B. Journal of Classroom Interaction 17, no. 1 (1981): 16-25	6 second and fifth graders who ranged in 25th-65th percent only	Classroom observations recording engaged activities only (putting name on paper, or other transitional activities not included).	Second graders engaged about 2 hr. 30 min. or 40% of in-class time: language/math academically engaged overall rate 84% in teacher groups; 70% with seat work. Amount of interim and wait time consistent across classes; off-task time were not.

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TABLE 1
(continued)

Study/Report	Reference	Population	Procedures	Highlights
"Classroom Management Practices in Industrial Education Laboratories: An Ecological Study"	Ponder, G., and Hinely, R. *Journal of Industrial Teacher Education* 19, no. 2 (1982): 27-37	10 industrial education student teachers in 3 high schools and 1 middle school	Narrative classroom observations of classroom management techniques	Purpose was to label and describe classroom management practices of smoothly run industrial education classes based on Kounin's criteria of task- engagement. "Better shops" had work involvement of 75% and 95%; others were below 50%.
A Place Called School	Goodlad, J. New York: McGraw-Hill, 1983	38 schools - elementary, junior and senior high: 1,350 teachers, 8,624 parents, 1,7163 students, 38 principals. Observed 1,016 classrooms.	Data collection teams observed, interviewed, and collected information from existing documents. Classroom observation methodology based on Stalling's work. Both qualitative and quantitative data were collected.	Study includes many components in addition to amount of class time spent on instruction was 70% at elementary level and around 75% in high school.
Time on Task in Selected Vocational Education Classes	Halasz, I., and Behm, K. The National Center for Research in Vocational Education, Columbus, 1983 (ED 229 528)	186 students and 10 teachers in 7 schools located in 4 states. 3 service areas--agriculture, marketing and distribution, and trade and industrial--included.	Observed, minute-by-minute, for ten entire class periods during two non-consecutive weeks in the spring of 1982. Over 11,400 minutes observed, recorded, and analyzed. Proportions of time calculated and comparisons conducted using F-tests and t-tests. Qualitative data also analyzed and reported.	Student time on task = 56% on content and 13% on noncontent. Time off task = 31%. Of time on task, 41% = technical skills, theory or practice. Teachers allocated 67% time for content and remaining 33% on managerial activities. Teachers spend 29% time on one-to-one instruction. Longest classes and classes with least students had highest proportions of time on task.

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Bloom's model of school learning was built upon Carroll's ideas (Bloom 1974, Carroll 1977). Bloom called the amount of time when the learner is actively engaged in learning the "time on task" (1974, p. 682). In his comprehensive review of differences in learning under different classroom conditions in different nations, states, and communities, Bloom found that

> while there can be no simple explanation for all these differences, it seems to some of us that the percent of time the student spends on task in the classroom may be a powerful variable underlying most of these differences. (1974, p. 684)

Bloom also commented that

> thorough understanding of time and its use in school learning may help us turn this great potential increasingly toward the improvement of the schools and the improvement of the human condition. (p. 686)

Wiley and Harnischfeger (1974) formulated a model that was based in part upon Wiley's analysis of the controversial Coleman report, Equality of Educational Opportunity (1966). Wiley's analysis in that study of the relationship between attendance and achievement indicated that the quantity of schooling has a powerful effect on determining achievement. In the Wiley-Harnischfeger model, as in Carroll's model, achievement is determined by two variables: the total time a student needs to learn a task, and the total time the student actually spends on the task. The influence of all other variables (curriculum, student, and teacher characteristics, quality of instruction) is overshadowed by these two time variables.

Results of Recent Studies

The three models of time and learning developed by Carroll, Bloom, and Wiley-Harnischfeger provided the theoretical foundation for several empirical, observation-based studies. These models of time were the basis of the concept of academic learning time that has been a major contribution of the Beginning Teacher Evaluation Study (BTES) (Fisher et al. 1978). The BTES findings on allocated and engaged time that substantially agree with earlier research are derived from a stronger and more sophisticated database (Borg 1980).

Through direct observation, BTES researchers (Fisher et al. 1978) collected longitudinal data about students' engagement or nonengagement in instructional tasks in elementary classes. Findings from the multiple linear regression analysis of the relationships between academic learning time and student achievement indicated that the proportion of allocated time that students are engaged in learning tasks was found to be related positively to achievement. In classes with the highest engagement rates, the teachers had allocated more time for the academic activities. Teachers allocated approximately 55 percent of the class time for academic activities, with another 25 percent devoted to subjects such as music, art, and physical education. The remaining 20 percent of the time was spent in noninstructional activities and transitions.

On the average, the second and fifth grade students in the BTES were engaged in math and reading about 73 percent of the allocated time. Overall, the students were engaged in academic activities about one hour and forty-five minutes or 40 percent of the in-class time. There was considerable variation among students, however, with some students engaged about thirty minutes more and others engaged about thirty minutes less than the average engagement rate (Rosenshine 1981).

The Follow-Through evaluation studies conducted by Stallings and her associates through the 1970s and 1980s (Stallings and Kaskowitz 1974; Stallings and Mohlman 1981) have provided improved classroom observation methodology and additional substantiation of the time-on-task theory of learning. Stallings's continual work has resulted in correlational and descriptive data about school effectiveness, including the use of time by elementary and secondary teachers and students in the classroom. Her findings indicate that the mere length of the school day or the length of class in secondary schools is not the critical factor in students' academic achievement. She stated, "Clearly student learning depends on how the available time is used, not just the amount of time available" (Stallings 1980, p. 11). Stallings has organized a teacher training institute to encourage teachers to spend more time instructing and managing students to stay on task during class time (Stallings and Mohlman 1981).

The notion that increased time on task will increase achievement is appealing as a simple solution to the problem of making academic education more effective. Several researchers have cautioned, however, that the time on task findings should not be interpreted to mean that merely increasing the engaged time will produce more learning for all students. Stallings's (1980, p. 12) comment sums up the views of such others as Soar (1978) and Evertson (1980), "For all students, there is a point at which more learning time does not produce more learning".

At this time, there is no known optimum time on task for most students, particularly the less academically successful students. It is believed, however, that less successful students need more time to learn than the more successful students (Bloom 1977). Data from Glaser (1968) and Atkinson (1968) suggest that the slowest 5 percent of learners take about five times as long to reach any given criterion of mastery as do the fastest 5 percent of the learners (Borg 1980). A number of studies (Block

1971; Peterson 1972) provide evidence that 80 percent of the students can achieve a level of learning that is usually attained by only 20 percent when there is an increase of 10 to 20 percent in learning time. However, in a more recent writing, Bloom (Carroll 1977) suggested that rates of learning are changeable.

Evertson (1980) reported a significant variation in student engaged time among achievement groups. On the average, low-achieving junior high students were engaged 40 percent of the time in academic content compared with 85 percent engaged time for high-achievers. Low-achievers spent more time waiting and doing nothing than did high-achievers.

Anderson and Scott (1978) examined the relationship among methods, students' verbal ability, students' academic self-concept, and students' time on task in a suburban high school. One of the major findings of the Anderson and Scott study is that different teaching methods can be useful for different types of students. Students with both low aptitude and a low academic self-concept seem to be the most affected by variations in teaching methods. Students with high aptitude and high academic self-concepts appear to be more off task in group settings than with any other method. More students, regardless of type, tended to show more on-task behavior with methods that provide two-way communication and that are largely teacher directed, such as discussions with questions and answers.

Another influence on the time-on-task studies has been Kounin's work on discipline (Kounin 1970). Both effective and ineffective teachers appear to handle discipline problems in much the same way. However, effective teachers manage classrooms in ways that prevent discipline problems from occurring in the first place.

Kounin (1970) identified the following categories of teacher behavior associated with high levels of time on task: with-it-ness, smoothness, momentum, variety, and group focus. All of the identified teacher behaviors relate to the flow and pacing of classroom activities. Different teacher behaviors were associated with high levels of time on task in different situations. "With-it-ness" and "smoothness" were associated with time on task regardless of the situation. "Variety" was important to seatwork but not recitations, whereas "momentum" and "group focus" were associated with high levels of time on task in recitation but not seatwork.

Later studies by Kounin and Gump (1974) developed the concept of a signal system that helps explain the previous findings. The situations themselves exert a "holding power" that can lead to high levels of time on task. The learning environment, teacher behaviors, or pacing of the lesson all can give the student signals.

To summarize recent studies of time on task, it appears that a positive relationship (correlational, not causal) between teacher-allocated time and student time on task and achievement has been established in the elementary-level studies. There is a temptation to apply the time-on-task findings from the academic elementary classrooms to the secondary-level vocational education classrooms. It is important, however, to recognize that there are usually significant differences between these two areas in their orientation, goals, structure, and student characteristics that have different implications for increasing student time on task.

The time-achievement research suggests that teachers should manage class time to provide adequate time for students to be engaged in learning. There is no formula for calculating the precise amount of time required for optimal learning at either the elementary or secondary level, nor is there any amount of time ideal for all the students in a heterogenous class. It is apparent, however, that where the opportunity for student time on task is increased, there is significant gain in student achievement.

Key Factors Affecting Students' Time on Task

Teacher Behaviors

Huitt and Caldwell (forthcoming) categorize teacher behaviors into two types: management behaviors and instructional behaviors. Management behaviors can be further broken down into three major concepts--selecting and arranging activities, monitoring student behavior, and dealing with misbehavior--which have further subdivisions as follows:

Selecting and Arranging Activities

- Use routines to reduce confusion
- Establish clear and consistent rules
- Plan for transitions between activities; have material ready
- Foster good student work habits
- Structure the physical environment to facilitate learning

Monitoring

- Move around the room to monitor behavior
- Pace activities appropriately

Stopping Misbehavior

- Anticipate consequences; head off misbehavior before it occurs
- State expectations for behavior clearly
- Hold students accountable for behavior
- Give feedback on behavior, perhaps privately

According to Huitt and Caldwell, rules and procedures are usually established during the first weeks of school. Thus, an observation team is not likely to note this factor unless the observations take place within the first few days of school. Since teachers and administrators often consider this the worst possible time to have observers, yearly "procedure setting" is seldom observed.

The relationship between teacher behaviors and the amount of student engaged time is complex, but several behaviors do seem to encourage student engagement. Huitt and Caldwell (forthcoming) have found a sequence of important instructional events emerging from the research and grouped these events into four major categories: presentation, practice, feedback, and monitoring. Specific behaviors can be identified under each category and organized into an effective strategy to achieve the specified goal of optimizing the amount of allocated time, engagement rate, or both.

Burnham (1983) has suggested that it is very important for the adult educator to be organized. In this article, organization

> entails developing objectives, goals, and a broad course outline which are made available in writing to the learners; developing lesson plans which include activities that appropriately mirror the cognitive taxonomy; and evaluating in writing or through conference, the learner's performance and products . . . when the teacher does not do those things out of respect for the learner, the all-too-clear message is that the learner is not important. (p. 34)

Pfannenstiel (1982) lists seven ways teachers can lessen transition time which coincide with Burnham's (1983) emphasis on organization:

1. Develop routines so that students know what will happen next.
2. Establish clear and consistent rules.

3. Structure the classroom so that it is easy to monitor all students.

4. Make sure that needed classroom materials for the day are easy to find and replace.

5. Set up the classroom to minimize distractions outside or inside the classroom.

6. Plan for transitions so that everything is ready and quickly distributed.

7. Foster good work habits in students. (p. 21)

A number of studies have focused on the relationship of teacher behaviors to student time on task. One study of 53 sixth grade teachers and a subsample of their students done by Fox, Peck, and Blattstein (1978) found a strong association between teachers exhibiting systematically organized classroom behavior and student time on task. In another study, standardized achievement was affected curvilinearly by time on task (Edwards 1981). Edwards cited a study by Peck and Veldman (1972) that focused on 165 second and third grade teachers. The study found that

> teacher characteristics which correlated highly with students' standardized achievement test score gains to have consistent negative affective impact, suggesting the possibility that the very values and procedures which tend to maximize the learning of the knowledge and skills tapped by standardized achievement tests may have adverse effects on pupil morale, interest, and long-term dedication to learning in a broad sense. (p. 16)

However, Barnes (1981) cautions that care must be taken not to overgeneralize from effective teacher behaviors that have been identified for specific grades, subjects, and groups of students. A causal relationship between teaching behaviors and achievement cannot be assumed since many variables are not controlled. Also, there could be interaction effects with subjects and/or grade level. There is also the question of what is the most desirable outcome of education.

Sirotnik (1983) found that about 75 percent of class time in both elementary and secondary schools was instructional. About 70 percent of total class time involved student-teacher interaction. About 20 percent of the teachers' time was equally divided between working alone (often at their desks) and monitoring or observing students. The other 10 percent included nonverbal response to students and walking around the classroom.

In his study of 1,016 classrooms, Goodlad (1983) found that teachers tended to use a very limited repertoire of teaching methods, spending most of their time talking and monitoring seatwork. The lack of instructional variety was less evident in the arts, physical education and vocational education classes. According to Goodlad, in these classes there typically are

> more demonstrations, discussions, various types of physical performing, and production of products other than written ones. These classes entail less lecturing, fewer written assignments, and fewer quizzes. Further more, students are considerably more involved in setting their own goals, choosing the subjects of study and work, and so forth. (1983, p. 467)

Absenteeism

According to a report by Stallings and Mohlman (1981), "Attendance is becoming a bigger and bigger problem in today's high schools. Clearly, teachers cannot reach students who do not appear in class" (p.5). Rutter et al. (1979) found that pupils attending 75 percent or more of school time had higher exam scores than students who attended less often. Frederick (1977) studied classroom time in low- and high-achieving Chicago schools. High-achieving schools were those above the median reading score for Chicago schools; low-achieving schools were defined as those below the median score. In the study,

> high-achieving schools have significantly better attendance, a higher level of involvement, fewer students going in and out, fewer interruptions, and more students doing the assigned homework than in low achieving schools. (p. 462)

Twenty-five percent of the available student time was wasted in the high-achieving schools due to absences, inattention, and interruptions. However, in low-achieving schools, 49 percent of available student time was wasted (Frederick 1977).

In a review of selected studies on time on task, Karweit (1983) stated that

> student absence varies by age and sex of student (Levanto 1973), by the location of the school (Statistics of State School Systems, 1978), by the size of the school (Lindsay 1982), and by the grade organization of the school (Slavin and Karweit 1982). (p. 7)

According to Karweit (1973), on any given day in an urban secondary school, there may be more students absent than present. Not only do absent students miss the learning time themselves, they reduce the time available to other students if the teacher has to review material missed. Levanto (1973) studied records of 310 students in a Connecticut high school during the 1971-72 school year and found the following patterns of absenteeism:

- Wednesday and Thursday have the lowest student absence rate. The rate is also lower on days of important tests, and other important activities.

- Males have a lower absence rate than females during the first three years, but senior males have a highe absence rate than females.

- Rate of absenteeism increased from ninth to twelfth grade.

- Students from two-parent homes have a lower absence rate than other students.

- College preparatory students have the lowest absence rate, next business education, then general.

- Seniors with the highest IQ's and academic achievement have the lowest absence rate.

- Rates were lower if students participated in both athletic and nonathletic activities than if they participated in one or none.

- Absenteeism is higher for black than for white students.

- The poorer the teacher's personality score, the higher the absenteeism rate of the students.

Caldwell, Huitt, and Graeber (1982) have stated that "the number of days in the year a student actually attends school is the most general measure of a student's involvement in learning" (p. 472). They list several factors that influence attendance--community beliefs, peer group, home environment, and the school and classroom environment.

Interruptions and Breaks

Stallings and Mohlman (1981) found that fewer students were on task in secondary classes where there were frequent interruptions by tardy students or announcements over the loudspeaker. There were also more teacher corrections for behavior in classrooms with more frequent interruptions. Not only was time lost due to the interruptions, but it took additional time for students to return to their on-task activities after each interruption.

Results of the Beginning Teacher Evaluation Study (Fisher et al. 1978) also showed that break time (including recess, lunch, restroom, etc.) in elementary classes was negatively correlated with student time on task. One possible explanation offered was that long periods of "play" carry over into work time (Rosenshine 1981). Henderson (1983) found during observation of secondary horticulture classes that

> disproportionate amount of time was spent on school and teacher prescribed breaks. The breaks appeared to be unnecessary, lengthy, and did not reflect true working conditions. Excessive break time may encourage inappropriate work habits. (p. 72)

Grouping

Studies of elementary classrooms that used small group instruction rather than total class instruction had less time on task. The teacher was often interrupted to discipline non-group members and seatwork was not as effective in keeping students engaged. In the Follow-Through studies conducted by Stallings and Kaskowitz (1974), teacher time spent working with one or two students was negatively correlated with student gain in achievement, whereas time spent in teacher-led groups was positively correlated with achievement. However, Karweit (1983) cautioned that it is necessary to consider more than just the quantity of instructional time. Different amounts of time yield similar results depending on the efficiency with which time is used. Grouping may be productive if the quality of time outweighs the time necessary for management. When working with the entire class, the teacher will usually pace the lesson for the average or middle-level ability students. Thus the lesson is likely to be too slow for higher-ability students and too fast for lower-ability ones. Grouping according to ability level potentially may increase the effective instructional time. The problem with grouping is the trade-off between increased instructional efficiency of those in the group and a reduced level for those students not involved at that time.

Time on Task and Effective Schools

Although in recent years effective school studies have received much attention, there seem to be many different ways to define what effective schools really are. Furthermore, it appears that effective school factors are so interrelated that it has been difficult to determine if the identified factors are what make schools effective or if schools that are effective exhibit these characteristics. Little (1981) looked at school success relative to staff development activities. Edmonds (1979) considered schools effective if low-income students achieved at the same level as the middle-income students. Rutter (1979) looked at consistent achievement test score gains, low absence rates, and positive student behavior (such as low delinquency rates and appropriate classroom behavior) as signs of school effectiveness. Stallings and Mohlman (1981) defined effective schools as those with high teacher morale, teacher implementation of time-use programs, students on task, low absence rates, friendly environment, and low litter and vandalism. Westbrook's (1982) study determined school effectiveness by student achievement test scores in the basic skills areas. Each of these studies described what effective schools are doing, according to their writers' definitions of "effective," but none actually showed what made these schools effective.

Westbrook (1982) identified several limitations or qualifications that should be considered when interpreting the findings of effectiveness studies. First, if the study bases its effectiveness rating on student achievement scores, there is no way to look at the relation of the total school environment on effectiveness. Second, the findings of the existing studies cannot be applied to other situations. Most studies are based on basic skills achievement in urban elementary schools. In addition, educators do not know how to change ineffective schools into effective schools. Therefore, factors that are found in the effective schools studied cannot necessarily be applied successfully to other situations. Third, existing studies do not show the large range of achievement variations between effective and ineffective groups. Comparisons with average groups would provide a more realistic picture of the differences. And finally, longitudinal studies of effectiveness are rare, so there is no way to measure changes over a period of time. Thus it cannot be determined if schools remain consistently effective. Schools that have only recently become effective may exhibit different factors than those that have maintained long-term effectiveness.

Many of the variables in effectiveness studies could be grouped under the category of classroom management, which includes the effective use of time. The Stallings and Mohlman study (1981) specifically defines effective schools as those with students on task and teachers implementing a time-use program. The classroom environment seems to reflect the management style of the teacher. In a descriptive study of Chicago-area schools, Wynne and Martens (1980) make the following observations about a junior high:

> I saw one group of students act up in a classroom where the teacher had no control. Then the rest of the day, where teachers were stricter and applied

> punishment, the same group behaved. If a teacher was very strict, they were very good. If a teacher allowed them some freedom, they took it. In some classes a lot of interactions and exchanges went on, and a great deal of enthusiasm was allowed, but it was obvious that the teacher had control of the class. (p. 145)

Teachers may not always be aware of the magnitude of management problems. In the same study Wynne and Martens interviewed both students and teachers:

> Ironically, when we asked teachers if they thought their students cut class often or cheated on exams, they believed that for the most part these things didn't happen. Our interviews with the students, however, indicated otherwise. (p. 32)

Mackenzie (1983) described the factors contributing to effective schools as a "culture of mutually reinforcing expectations and activities" (p. 8). Three dimensions of effective schools were identified: leadership, efficacy, and efficiency. The efficiency dimensions include such elements as effective use of instructional time, orderly classroom environment, and well-structured classroom activities.

Although there are many characteristics found in effective schools, the time students are engaged in learning and the factors contributing to that time appear to be integral parts of an effective school according to the studies reviewed.

CHAPTER 3

METHODOLOGY AND PROCEDURES

Rationale

The rationale for the design of the current study was based on recommendations from the previous study, concepts of time use, findings from related studies, and the objectives of the current study. In addition to the recommendation to investigate teacher instructional/managerial variables, the previous study indicated other factors that could potentially influence student time use in vocational classes. Reviews of related studies and face-to-face or telephone discussions with other researchers of time on task (Lorin Anderson, Judy Pfannensteil, Nancy Karweit) confirmed that a number of additional factors should be considered in the current study. As a result, several other variables were added for observation. These included the grouping of students in a class, whether in one room or more than one room; whether all students were working on the same task or different tasks; the amount of distraction coming from within the classroom, or from outside the classroom; the type and amount of interaction between the students and the teacher; how effective the teacher was at noticing students' needs; the number of transitions during a class period, and the intensity of student involvement.

As a result of the previous study, a classification of student time use was developed, which is shown schematically in figure 2. As figure 2 shows, time on content included basic skills (reading, writing, computation), the theory of technical skills, practice of technical skills, employability skills, youth organization activities, and any other content-related activities. Time on noncontent included other youth organization activities, work assigned by the teacher but not content related, set up and clean up, and other noncurriculum-related activities.

Time on break was considered separately from time off task because it was not a student-initiated off-task activity. Time on break was mandatory in many cases due to school or state regulations. Time off task included student-initiated time spent waiting, socializing, goofing off, leaving the room, or other time not on task. Other decisions prompted by the results of the previous study were a reduction in the number of observations necessary to collect reliable data and the need to record descriptive information about interactions and special situations. Also, it was concluded that since marketing and distributive education classes had far more simulation as opposed to realistic practice of skills, another service area would be more useful for study of time on task. Therefore, business and office classes were selected (rather than, for example, marketing and distributive education classes). Finally, the objectives of the current study were to expand the sample to include postsecondary vocational-technical classes.

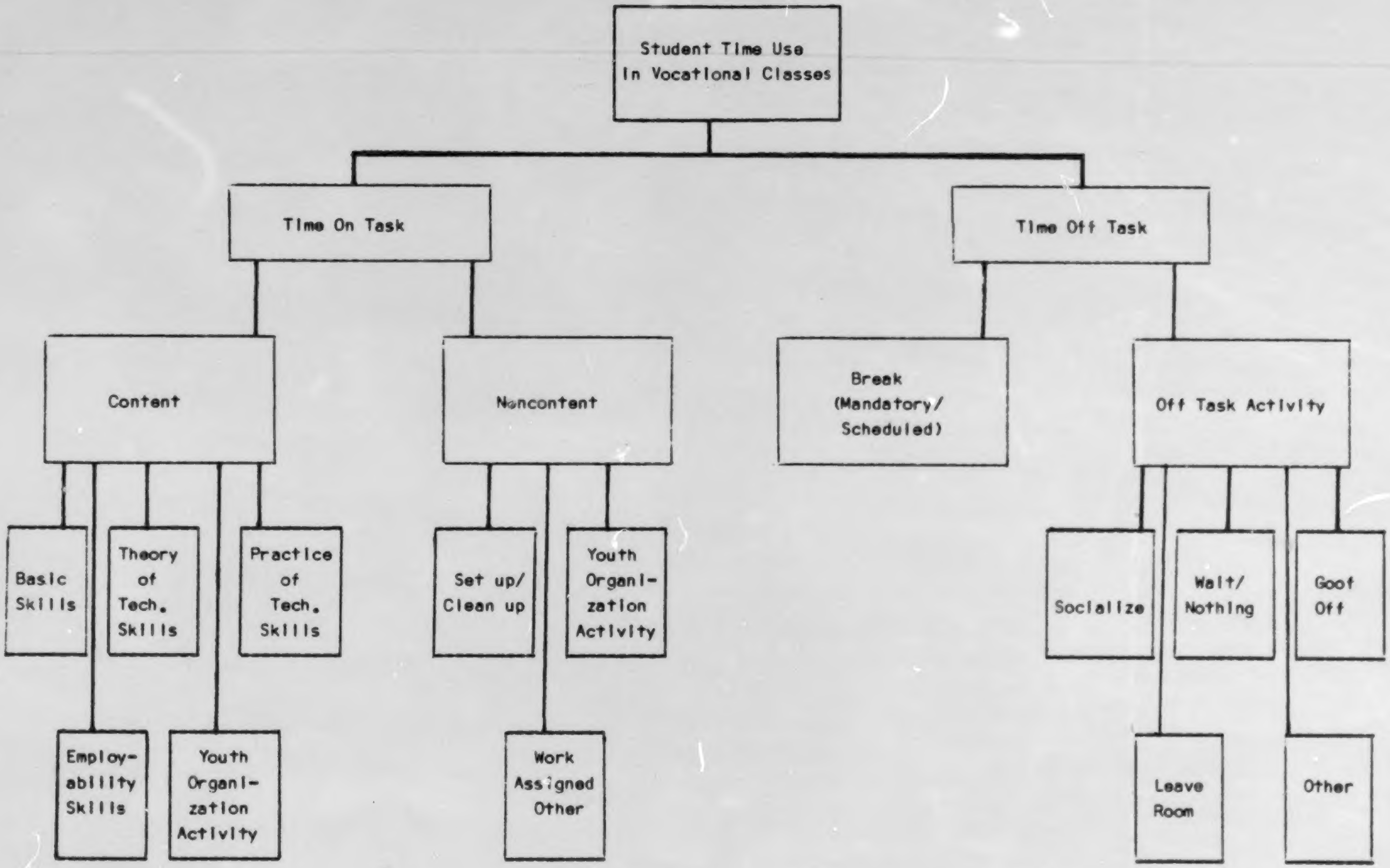
Student Time Use in Vocational Classes
Time On Task
Time Off Task
Content
Noncontent
Break (Mandatory/ Scheduled)
Off Task Activity
Basic Skills
Employ-ability Skills
Theory of Tech. Skills
Youth Organi-zation Activity
Practice of Tech. Skills
Set up/ Clean up
Work Assigned Other
Youth Organi-zation Activity
Socialize
Leave Room
Wait/ Nothing
Other
Goof Off

Figure 2. Breakdown of student time use in vocational classes

Sample

Both secondary and postsecondary classes were deliberately selected for participation in this study. The sample selection resulted in nine secondary classes and sixteen postsecondary classes.

Secondary Classes

It was first determined that, if possible, classes would be selected at the schools where the previous study was conducted. One reason was that information was already available about these schools and their respective communities. Second, it would be easier to gain permission to conduct the study at these schools rather than new schools. And, most important, these schools were known to meet the other criteria for selection which were--

- permission for participation from the state director of vocational education,
- proximity (for budget purposes) to the National Center,
- possession of at least two of the following vocational program areas: agriculture, business and office, and trade and industrial education.

The additional criterion was that each site had to have a viable postsecondary institution that would agree to participate in the study. This was necessary to make the best use of staff and travel resources. The two sites that met all of the criteria were asked to participate in the study.

Throughout the selection process typical classes were requested, as opposed to exemplary ones. The vocational directors made their final selections of the specific classes for inclusion based upon which vocational program areas were represented at their schools and the times the classes were scheduled. Working with unavoidable scheduling conflicts, time and resource limitations, spring vacations, and other constraints, the researchers made the final selection resulting in the nine classes displayed in table 2.

As indicated in table 2, five classes were selected at the midsized urban site. One represented agriculture education, two represented business and office education, and two represented trade and industrial education. Four classes were selected at the inner-city site. One represented agricultural education, one represented business and office education, and the remaining two represented trade and industrial education.

TABLE 2

DISTRIBUTION OF SECONDARY CLASSES PARTICIPATING IN THE STUDY BY PROGRAM AREA AND SITE

Site	Agricultural Education	Business and Office Education	Trade and Industrial Education	Total Number Classes
Midsized urban	1	2	2	5
Inner city	1	1	2	4
Total number of classes	2	3	4	9

Postsecondary Classes

The selection of the postsecondary institutions was obviously influenced by the decision to return to previously selected secondary schools. However, the selected schools were required to meet the following criteria:

- Agreement to participate from the chief administrator and, in some cases, from specific instructors who taught the courses in the requested program areas
- Possession of at least two of the following vocational-techncial program areas: agriculture, business and office, trade and industrial, and technical education

The same constraints for the selection of the secondary classes applied to the postsecondary selections. An additional constraint, however, was that at one of the two institutions classes were held once a week instead of each day. Since that institution met the other criteria, it was determined that more classes would be observed even if they were only observed twice during the two weeks scheduled for the observations. The final selection resulted in the sixteen classes displayed in table 3.

TABLE 3

DISTRIBUTION OF POSTSECONDARY CLASSES PARTICIPATING IN THE STUDY BY PROGRAM AREA AND SITE

Site	Agricultural Education	Business and Office Education	Trade and Industrial Education	Technical Education	Total Number Classes
Midsized urban	0	4	1	1	6
Suburban	1	5	0	4	10
Total number of classes	1	9	1	5	16

As shown in table 3, there was an uneven distribution of classes across sites and across program areas. At the midsized urban site, four classes represented business and office education, one class represented trade and industrial education, and one class represented technical education. At the suburban site, one class represented agricultural education, five represented business and office education, and four represented technical education.

Instruments

Two observation guides were developed for the study. The guides, called Observation Guide I and Observation Guide II, are shown in the Appendix. The guides were designed to record each minute of class time. Each of the observers used only one type of guide throughout the study. This practice is believed to increase the observers' proficiency and their reliability in making judgments for the observations. The guides were designed to eliminate the need for recoding or transcribing the information for data entry. Each page of Observation Guide I was designed to record fifteen minutes of class time. For example, if the class being observed was 150 minutes long, then ten pages were used to record the time used in that class. Similarly, each page of Observation Guide II was used to record five minutes of class time, requiring thirty pages for a 150-minute class. The guides were similar in format to those used in the previous study, but differed in content since additional variables were added. Consequently, more details could be recorded to provide data about the factors such as grouping and interruptions.

Codes Used in Observation Guides

Observation Guide I was used to record student and teacher time use, as well as student grouping on a minute-by-minute basis. The first seventeen columns were used to record identification codes--time of day, date, observer, site, level school, service area, class, and teacher type. Codes for student dispersement (location in one or more rooms) and student grouping (whether whole class, group, or individual work on task) were recorded in the next two columns. The teacher's opportunity to view students, opportunity to interact with students, role (actual observation of and interaction with students), task (purpose of teaching behavior), and primary teaching method were recorded in code form in the subsequent seven columns.

Student time use was recorded in the remaining columns of Observation Guide I. Student time was classified as time on content, on noncontent, and off task. Each of these classifications was subdivided to indicate specific types of activities such as time on theory and time on setting up/cleaning up. Finally, the last two columns of Observation Guide I were used to record the number of students enrolled in the class that day and the exact number of students present during each minute.

The first seventeen columns in Observation Guide II were used to record the same identification information recorded in Observation Guide I. Codes for disruptions, interruptions, transitions, student involvement, and teacher with-it-ness were recorded in the next five columns. The observer used the remaining space to write a narrative based on the following questions:

- How is the teacher maintaining activity flow?
- Is the teacher behavior appropriate; on task?
- What appear to be the time controls/standards for student behavior?
- What behavior setting/content variables seem to influence time on task?

Validity and Reliability

As in the previous study, direct observation was considered the best method for studying how teacher instructional/ managerial behaviors relate to students' use of time in vocational education classes. However, many problems with validity and reliability are inherent when using the direct observation method. The observation guides were modified from those developed for the previous study, and their reliability and validity were considered in several ways.

Validity. One of the assumptions of this study was that there are major curricular content areas or tasks that are included in all vocational programs. It was believed that these curricular content areas would be valid for both the secondary and postsecondary levels. Thus the observation guides included codes for the curricular content area, for classroom variables, and for teacher instructional/managerial behaviors that were based upon findings from the previous research and related studies. The codes were pilot-tested in secondary and postsecondary business and office, agriculture, trade and industrial, and technical classes. The codes were subsequently refined to reflect the classroom situations encountered in the pilot-test classes.

Observer interference. Kerlinger (1973) minimized the potential problem of observer interference when he explained that observers have little effect on situations they observe. Kerlinger pointed out that people adapt quickly to the observer's presence and continue to do what they usually do. "Indeed," he said, "it is more of a problem to the uninitiated who seemed to believe that people will act differently, even artificially when observed" (p. 538). According to Ryan (1960), the classic belief is that teachers will act in an unusually perfect way when being observed. Although this may be true in some cases, it should be recognized that teachers cannot do under observation what they have never learned to do.

Most of the teachers in this study were observed for a week (five days), from the beginning to the last minute of each class period. It was therefore believed that, as Kerlinger (1973) and Ryan (1960) indicated, that the teachers were behaving in their usual ways during the observations.

Observer reliability. Although Kerlinger (1973) discounted observer interference as a serious problem in direct observation studies, he believed that observer reliability is a potential problem.

> The observer must digest the information derived from observations and then make inferences about constructs . . . The strength and the weakness of the procedure is the observer's power of inference. (p. 538)

Medley and Metzel (1963) recommended that observers should consciously use the least inference possible in describing whether a behavior occurred. To this end, the observers in this study recorded specific activities as they occurred each minute. The fast-paced recording of activities prevented the observers from reflecting upon the events and second-guessing the students' or teachers' intentions. As a result, activities were recorded with a minimum of observer inference.

Reliability among observers. Flanders (1967) commented that "the ideal observer team is a group of like-minded individuals who will respond consistently with the same category number when presented with the same communication events" (p. 158). The pilot tests resulted in considerable reliability (.85) among the observers. In this study the potential problem of reliability among observers using the same instrument was further minimized. A total of four observers conducted all of the observations. Two of the observers collected all the secondary data while another two collected all the postsecondary data. Each observer used only one of the observation guides, further minimizing potential problems with interrater reliability for either secondary or postsecondary observations.

Field Procedures

The Pilot Test

The first drafts of the observation guides were used in pilot tests at a local secondary school and a postsecondary institution. The field procedures and the process of recording observations every minute were tested in several types of vocational-technical classes. All but one of the four pilot-test staff had collected data for the previous study. The four members of the pilot-test staff were scheduled to collect all the data for the current study. The pilot-test staff used the specific observation guide (Observation Guide I or Observation Guide II) they would use to collect the study data.

After the pilot test, the two observation guides were revised to include more precise codes. The pilot-test staff reported that the minute-by-minute data recording procedure as comfortable, not too demanding, and not too boring for the length of time spent observing. They found the codes relatively easy to remember and to apply in the actual classroom situations.

Data Collection

The five secondary and two postsecondary schools selected for participation in the study were located at two geographic sites. Site 1 was an industrial metropolitan city surrounded by suburban areas that are closely linked economically. In contrast, Site 2 was a homogeneous midsized city. Data were collected at each site for two nonconsecutive weeks in March and April 1983.

Different classes were observed during the first week than during the second at the secondary schools and at one of the two postsecondary institutions. Since the second postsecondary institution held classes only once a week (as opposed to every day of the week), the same classes were observed both weeks in order to collect at two entire class periods of data for the classes. Two teachers were observed teaching three classes each week.

The four observers for the study comprised two teams, one for secondary and one for postsecondary. Once at their respective schools, the team members talked briefly with the teachers they were to observe. They explained the observations procedures and answered questions. The observers explained that they would move with the students--from lecture rooms to shops to remote areas--in order to record the students' activities accurately. The observers asked the teachers to ignore them as much as possible by not introducing them or accommodating them by, for example, asking students to bring them chairs in the shop area. In turn, the teachers requested that the observers comply with safety rules by wearing safety glasses and following other precautions in the shops.

In all situations, the observers were as inconspicuous and as unobtrusive as possible. They sat at the back of classrooms during lectures and quietly moved around in the shops or laboratories. Especially after the first day of observation, the teachers and students did not appear disturbed or motivated by the observers. In most classes, the observers found that students and teachers were initially shy about approaching them. After the first two or three days, however, a few students asked, "How are we doing?" or "What are you evaluating?" The observers responded very briefly and discouraged further conversations in a friendly, but firm manner. When opportunities for conversations arose outside of the classes, the observers answered questions.

The observers started recording when the class was officially scheduled to begin. The observers scanned the classroom to record student activities as well as the teacher's activities. While some activities, such as practice of technical skills on a piece of equipment, continued for several minutes, other activities took very small amounts of time. For the most part, the observers recorded the specific activity they viewed that instant. However, if students were working on a piece of equipment and looked away briefly, they were not recorded as off task. Yet, other activities which also took relatively small amounts of time, such as calculating the length of a pipe to cut, were indicated when observed (basic skills).

The observer, using Observation Guide II, wrote a narrative of activities that were not recorded in code form by the observer who was using Observation Guide I. Consequently, a thorough record was made of each class observed that indicated student and teacher interactions and ways in which teachers managed the class time.

Data Analysis

The data from the secondary classes were analyzed separately from those collected in the postsecondary classes. In effect, this resulted in two studies conducted and analyzed concurrently. While more postsecondary classes (16) were observed than secondary classes (9), the total minutes for each level were approximately the same. As shown in table 4, 5,938 minutes were observed in secondary classes, whereas 5,915 minutes were observed in postsecondary classes. As mentioned earlier, the postsecondary classes at Site 2 were held once a week, which limited the number of possible observations. Each class was observed once each week during the two weeks of observation. The classes at the secondary schools at Site 1 and at the schools at Site 2 were observed five times consecutively during one of the weeks of observation.

TABLE 4

NUMBER OF MINUTES OBSERVED IN
SECONDARY AND POSTSECONDARY CLASSES

Secondary		Postsecondary	
Service Area	Number of Minutes	Service Area	Number of Minutes
Agriculture	1537	Agriculture	328
Business and Office	1289	Business and Office	2957
Trade and Industrial	3112	Trade and Industrial	830
		Technical	1800
Total minutes observed	5938		5915

Collapsed and Deleted Variables for Analysis

Some of the data collected and classified according to the codes in the observation guides were recoded or deleted for analysis. Several of the variables coded in the two observation guides were found to be redundant or not as useful as planned. Data collected according to those codes were not used, whereas other data were collapsed for more concise analyses and discussion of the results. The deleted and collapsed variables are listed in table 5, while the remaining variables are shown in table 6.

TABLE 5

COLLAPSED AND DELETED VARIABLES FOR ANALYSIS

Variables Coded in Observation Guide I	Change	Process/ Reason for Change
1. Student Dispersement (five categories) and Student Grouping (two categories)	Collapsed into four categories and renamed the Grouping or Group Variable as illustrated	There were too few cases in most categories as originally coded. Chi square analysis was used to collapse categories.
2. Teacher Opportunity to View Students (six categories) and Teacher Opportunity to Interact with Students (six categories)	Deleted from all analyses	Through regression analysis, these two variables were found to measure the same phenomenon as the Teacher Role variable.
3. Teacher Task (fifteen categories)	Deleted from all analyses	Observers found these codes to be confusing and redundant with the Teacher Method codes.
4. Teacher Role (sixteen categories)	Collapsed into eleven categories	Since several codes were not different enough to warrant separate consideration in the analyses, they were collapsed. None of the codes were eliminated.

		Student Dispersement	
Student Grouping		In more than one room	In one room
	Group/individual tasks	Group 1	Group 2
	Entire class on one task	Group 3	Group 4

TABLE 5

(continued)

Variables Coded Observation Guide I	Change	Process/ Reason for Change
5. Basic Skills and Employability Skills and Youth Organization Activities (Content) and Other On-Task/Content	Reported in descriptive tables but subsequently as Time on Task Theory for analysis of variance and crossbreak analysis.	Very small proportion of time spent upon these content-related activities especially at the postsecondary level. Since most of these activities were theory oriented as opposed to practice, they were collapsed with theory.
6. Youth Organization Activities (Noncontent) and Assigned but Noncontent and Set up/Clean up and Transitional and Other Noncontent	Reported in descriptive tables but subsumed as Time on Task Noncontent for analysis of variance and crossbreak analysis.	Most of the noncontent time was spent on set up/ clean up. Since very small proportions of time were spent on the remaining noncontent activities, they were collapsed in one category as time on task/noncontent.
7. Waiting; Doing Nothing and Socializing and Goofing off and Restroom; Leave Room and Other Time Off Task	Reported in descriptive tables but subsumed as Time Off Task for analysis of variance and crossbreak analysis.	The particular time-off-task activity was not essential to the analyses. Thus, all off-task activities were collapsed into one category.

TABLE 5

(continued)

Codes Used in Observation Guide II	Change	Process/ Reason for Change
8. Transitions	Deleted from all analysis.	Observers found transitions difficult to recognize and record. Thus, since observers believed the data were not accurately recorded, the data were deleted.
9. Student Involvement	Deleted from all analysis	Through regression analysis, this variable was found to measure the same phenomenon as student time on task for content-related activities. To eliminate redundancy and possible confusion, this variable was deleted.

There were, obviously, far fewer variables for analysis after several were collapsed or deleted. The remaining variables and transformed variables were listed in table 6.

TABLE 6

VARIABLES (REMAINING OR TRANSFORMED) USED IN THE ANALYSIS

Variable Name	Subcategories	
1. Student Grouping or Group	Four Subcategories:	
	Group 1:	Students are in two or more adjoining rooms and are working individually or in small groups on various content.
	Group 2:	Students are in one room and are working individually or in small groups on various content.
	Group 3:	Students are in two or more adjoining rooms but are working as a class on one content area.
	Group 4:	Students are in one room and are working as a class on one content area.
2. Teacher Role	Five Subcategories:	
	Role 1:	Observing all/interacting with all students in class
	Role 2:	Observing and interacting with group/individual
	Role 3:	Observing activity but not interacting (monitoring)
	Role 4:	In room/office but not observing or interacting
	Role 5:	Not in room at all
3. Teacher Methods	Eleven Subcategories:	
	Method 1:	One-to-one instructions
	Method 2:	Discussing/questions and answers
	Method 3:	Socializing
	Method 4:	Lecturing/using audio-visuals
	Method 5:	Making announcements/passing out materials
	Method 6:	Cleaning up/setting up
	Method 7:	Giving directions/demonstrating/explaining
	Method 8:	Testing/inspecting work
	Method 9:	Observing students
	Method 10:	Working on own/doing paperwork
	Method 11:	Using other methods/miscellaneous

TABLE 6
(continued)

Variable Name	Subcategories
4. Teacher With-it-ness	Five Subcategories: With 1: Sensitive to all/sensitive at many levels With 2: Sensitive to most needs With 3: So-so/variable sensitivity to needs With 4: Not sensitive to most students With 5: Not sentisitve at all
5. Student Time on Theory	Includes theory of technical skills, basic skills, employability skills, youth organization skills and other content which is not specifically time on practice.
6. Student Time on Practice	Includes only hands-on practice of technical skills.
7. Student Time on Breaks	Includes only time on scheduled or mandatory breaks.
8. Student Time Off Task	Includes waiting, socializing, goofing off, using the restroom, leaving the room, and other time off task.
9. Disruptions	Includes time during which disturbances occur within the classroom interrupting time on task.
10. Interruptions	Includes time during which disturbances from outside the classroom interrupt time on task.

Unit of Measure

Since the data were collected on a minute-by-minute basis, the minute was used as the primary unit of measure. To calculate the student time use on and off various activities, the raw numbers (of minutes spent upon various activities) were converted to proportions of the total number of minutes available during each class. The proportions (or percentages) were calculated with the following formula:

$$\frac{\text{number of student minutes spent on the activity}}{\text{number of class minutes X students present in the class}} = \text{proportion of time on the activity}$$

For example, to find the proportion of time spent on basic skills in a fifty-five-minute class with fifteen students, the following equation was used:

$$\frac{\text{Total student minutes on basic skills} = 150}{\text{55 minutes x 15 students present} = 825} = .18$$

As the equation indicates, the numerator was 150. It was calculated by counting the total number of minutes spent on basic skills during the class. The denominator was 825, which was calculated by multiplying the number of class minutes by the number of students present. The proportion of time, found through dividing 150 by 825, was 18 percent. Similarly, to calculate the teacher time used for role, method, and with-it-ness, the raw number of minutes was converted to proportions of the total number of minutes available during each class. The following formula was used:

$$\frac{\text{number of teacher minutes spent on the activity}}{\text{number of class minutes}} = \text{proportion of time on the activity}$$

Thus, if the teacher spent twelve minutes on one-to-one instruction in a fifty-five-minute class, the proportion of time was 21 percent on one-to-one instruction.

Statistical Procedures

PLI language special programs were used to organize, rename, edit, and manipulate the raw data. Computer-based procedures from the Statistical Package for the Social Studies (SPSS) (Nie et al. 1975) and PLOTALL (Seymour and Wiggins 1981) were used to analyze the data and produce pie charts and tables. PLOTALL pie plots procedure was used to present the student time use data in the shape of a pie. Each slice of the pie represented one type of time use (e.g., time on practice). The size of the slice represents the percentage of the total class time. Pie charts were created for the average of all the secondary and the postsecondary classes and for each service area.

Through SPSS descriptive statistics procedures, the raw data (minutes spent on various activities by teachers and students) were converted into proportional data. Further descriptive statistical procedures were used to create tables of distributions and frequencies. These tables indicated the proportions of time students and teachers spent on specific activities. In the tables the proportions were classified in various ways, including by level (secondary or postsecondary), by service area (agriculture, business and office, trade and industrial, technical), and by individual class (nine secondary and sixteen postsecondary).

The primary data analysis was conducted by computing means of proportions of time and breaking them down by the explanatory variables. SPSS crossbreak procedures were used to study relationships among the variables. For example, crossbreak analysis was used to determine the relationships of teacher methods to student time on theory, practice, noncontent, and off task in secondary classes. The architecture of the crossbreak procedure used in that example is depicted in figure 3. Notice that in figure 3 all the class minutes are broken down by the eleven categories of teacher methods, which are broken down by the three secondary student group types, which in turn are broken down by the four categories of student time use. All analysis was done for the full sample and was replicated for each service area.

One-way analysis of variance was used to determine if there were significant differences within the independent variables relative to student time on task. For example, the teacher withit-ness variable has five levels from "sensitive to all students needs" to "not sensitive at all". Through one-way analysis it was determined that students spent significantly more time on theory when teachers were more sensitive to their needs. Similarly, one-way analysis of variance was used to determine the relationships of teacher methods, teacher roles, interruptions, disruptions, and student grouping to student time on theory, practice, noncontent, and off task.

To overcome possible statistical problems caused when using proportional data in analysis of variance, the data were stabilized through the arc sine transformation. Although this function changed the levels of significance somewhat, the levels of significance nonetheless remained at $p>0.001$.

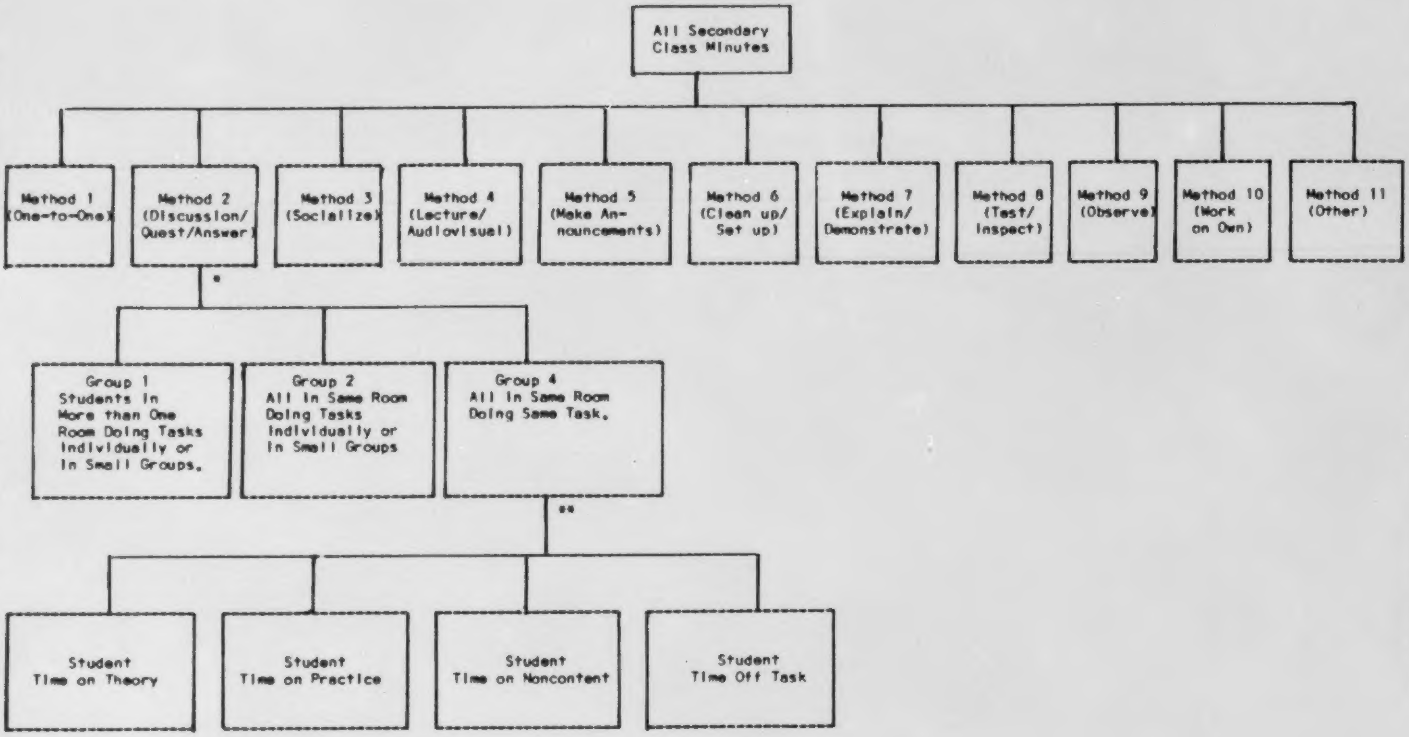
All Secondary Class Minutes
Method 1 (One-to-One)
Method 2 (Discussion/ Quest/Answer)
Method 3 (Socialize)
Method 4 (Lecture/ Audiovisual)
Method 5 (Make Announcements)
Method 6 (Clean up/ Set up)
Method 7 (Explain/ Demonstrate)
Method 8 (Test/ Inspect)
Method 9 (Observe)
Method 10 (Work on Own)
Method 11 (Other)
*
Group 1 Students in More than One Room Doing Tasks Individually or in Small Groups.
Group 2 All in Same Room Doing Tasks Individually or in Small Groups
Group 4 All in Same Room Doing Same Task.
**
Student Time on Theory
Student Time on Practice
Student Time on Noncontent
Student Time Off Task

Figure 3. Architecture of crossbreak procedure used for analysis of relationships among variables.

* While only one method is illustrated, each method is broken down by these three grouping variables. There is no Group 3 in secondary classics.

** Again, only one group is illustrated but each group is broken down by student time.

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To further ensure that the results of the analyses were valid, the one-way analysis of variance were also conducted with every fifth minute of data. These analyses were conducted to determine whether or not the fact that the minute-by-minute data were repeated measures as opposed to independent measures affected the level of significance. The results indicated that the significant differences using every fifth minute were similar to those that occurred when using every minute of data.

CHAPTER 4

FINDINGS AND CONCLUSIONS

Introduction

Answers to the research questions listed in chapter 1 were found through analyses of the data recorded during 5,938 minutes of observation in secondary classes and 5,915 minutes in postsecondary classes. The data included both quantitative and qualitative information observed during entire class periods. The data from secondary and postsecondary classes were analyzed and reported separately in this chapter. Thus all five research questions are first answered for the secondary classes and then followed by the postsecondary findings.

Findings and Conclusions Related to Secondary Time Uses, Teacher Behaviors, and Classroom Variables

Question One (Secondary)

> What are the characteristics of the classes included in the study?

The nine secondary classes observed in the study were located in five schools at two sites. Site 1 was the inner-city of a diverse industrial metropolis. Site 2 was a medium-sized service-oriented city surrounded by prosperous farms. Table 7 displays the characteristics of each class. (Note: The first of the class code numbers is the site number.) As shown in table 7, there were two agriculture classes, three business and office classes, and four trade and industrial classes. Two business and office classes were located in comprehensive high schools, whereas the remaining seven classes were in area vocational schools.

The classes ranged in length from 55 minutes to 180 minutes or three hours. Seven of the classes were between two and three hours long. With one exception, the classes were observed five times, Monday through Friday of the same week. The exception was the carpentry class, which was observed only four times due to a blizzard that closed the school on the Monday morning of the observation week. The types of curriculum listed reflect the teachers' self-report (as opposed to the observers' perceptions) of the curriculum used in their classes.

As displayed in table 8, the total enrollment in all secondary classes was 152 students. More than half were white (81) with the remaining (71) blacks or other minorities. The minority

TABLE 7

CHARACTERISTICS OF SECONDARY CLASSES

Class/ Class Code	Type of School	Type of Community	Length of Each Class in Minutes	Total Number of Classes Observed	Type of Curriculum
		Agriculture			
Ornamental Horticulture (20301)	Vocational	Midsized Urban	175	5	State and locally developed competency based
Horticulture (10101)	Vocational	Large inner city	150	5	State developed, performance based
		Business and Office			
Typing II (20408)	Comprehensive	Midsized Urban	55	5	Locally developed
Word Processing (10223)	Vocational	Large inner city	145	5	Performance based
Data Processing (20407)	Comprehensive	Midsized Urban	55	5	Locally developed
		Trade and Industrial			
Electronic Communications (10222)	Vocational	Large inner city	140	5	State developed, performance based
Carpentry (10102)	Vocational	Large inner city	140	4	State developed, compentency based
Auto Mechanics (20509)	Vocational	Midsized Urban	180	5	Competency based
Machine Shop (20305)	Vocational	Midsized Urban	175	5	Competency based

TABLE 8

ENROLLMENT IN SECONDARY CLASSES

Class/ Class Code	Total Enrollment	Minority	White	Male	Female	Handi-capped
Agriculture						
Ornamental Horticulture (20301)	14*	0	14	10	4	Yes
Horticulture (10101)	10	4	6	6	4	Yes
Business and Office						
Typing II (20408)	12	2	10	1	11	No
Word Processing (10223)	16	16	0	0	16	
Data Processing (20407)	22	9	13	5	17	No
Trade and Industrial						
Electronic Communications (10222)	23	19	4	21	2	No
Carpentry (10102)	19	16	3	19	0	Yes
Auto Mechanics (20509)	15	2	13	15	0	No
Machine Shop (20305)	21	3	18	21	0	Yes
TOTALS	152	71	81	98	54	

*Class was open entry/open exit. Number reported was the number observed.

students were concentrated at the inner-city site schools. There were almost twice as many males (98) as females (54), with the females concentrated in the business and office classes. The teachers said there were mainstreamed students with some type of handicaps in four of the classes, but did not enumerate them nor point out the specific handicaps. During the observations, it was difficult to discern which students were handicapped or if they had difficulties learning or practicing the vocational skills.

Teacher characteristics, cited in table 9, indicate that all of the business and office classes were taught by female teachers. Conversely, all the agriculture and trade and industrial classes were taught by male teachers. All of the teachers had at least five years of teaching experience and at least two years of experience in industry. Two of the teachers taught that class only once a day, whereas the others taught it twice a day.

The secondary teachers appeared to know their subject matter well but did not use a variety of teaching methodologies. Although the numerical data indicate high percentages of student time on content, the narrative data suggest that the quality of the time may be questionable. The students may have been doing what the teacher requested, but the observers had a sense that overall goals were lacking sometimes and the activities did not always contribute to effective learning or practice of skills related to the curriculum.

Agriculture classes. The teachers in the two secondary agriculture classes had problems keeping track of all their students because there often was more than one work area. Both of the agriculture classes had a greenhouse and a classroom. One class (20301) also had a retail sales program, which meant there were interruptions from visitors who wanted to buy plants. However, because students were working individually or in small groups much of the time, the interruptions did not seem to bother most of them.

Teachers in both agriculture classes provided a great deal of one-to-one instruction to show students how to do certain tasks and to answer their questions.

One class (20301) had a mixture of adult and high school students. One of the teachers was very young and related to the students more as a buddy or one of the gang rather than a professional. The students stayed under control because of the friendship, not because he was the instructor. The adults were more motivated and appeared to be much more involved with their work than the high school students. This appeared to be due to their own initiative rather than any inducements from the teacher. The teacher spent little time on task himself. He looked for excuses to leave the classroom and spent much time on the telephone.

TABLE 9

TEACHER CHARACTERISTICS IN SECONDARY CLASSES

Class/ Class Code	Minority	Sex	Years Experience in Education	Years Experience in Industry	Teach Same Class More Than Once a Day
			Agriculture		
Ornamental Horticulture (20301)	No	M	5	?	Yes
Horticulture (10101)	Yes	M	18	?	Yes
			Business and Office		
Typing II (20408)	No	F	21	2	No
Word Processing (10223)	Yes	F	9	11+	Yes
Data Processing (20407)	No	F	10	2	No
			Trade and Industrial		
Electronic Communications (10222)	No	M	10	5	Yes
Carpentry* (10102)	Yes	M	16	3	Yes
Auto Mechanics (20509)	No	M	5	6	Yes
Machine Shop (20305)	No	M	10	11	Yes

* There was also an assistant teacher who was a minority male.

In the other class (10101), the teacher was always on task. He kept the students on task by moving around and checking on their activities. According to this teacher, all the students were slow learners. The observers noted that the teacher's routine was lecture for part of the class time every day. However, the vocabulary was too difficult for the slow learners to be able to take notes. The instructor was obviously not trained to work with special needs students. After he repeated information and examples several times and students still did not understand, he became harsh. This upset the students and seemed to compound their lack of understanding. During a conversation with the observers, the instructor said that the students would never be able to work without close supervision. The observers noted that perhaps since this teacher did not expect much from the students, the students did not perform. The teacher's frustration was evident throughout the observations.

Business and office classes. Equipment appeared to be a problem in some of the secondary business and office classes. The word processing class (10223) had more students than machines. As a result, one student was almost always off task because she did not have a machine to use. A typing II (20408) class was using outdated machines that did not have correcting capabilities. Repairmen were working on typewriters in the two classes and this did not seem to be an unusual occurrence.

The observers noted that there were well-defined goals for the two typing classes (10223 and 20408). In both classes there seemed to be a well-established pattern of activiites that kept the students on task most of the time. An observer noted about the inner-city word processing class (10223):

> The teacher had an established pattern for the students. She had them do a timed test at the beginning of each period. The student denoted as the supervisor for the day conducted the test. This left the teacher free to take roll or to take care of other managerial responsibilities.

The third business and office class (20407) had a substitute for three days and the fifth day was "senior skip day," so only two students were present in that class. Since the regular teacher was only present for one day, it could not be determined how typical the observed classes were. However, students did not seem to be settled into any kind of routine. Students came late, left early, and appeared to spend little time on task.

In all three classes, the teachers were doing a variety of things while students were working. The typing teachers appeared to sense whether students were on task by the sounds in the class. The observer's notes indicated that one teacher (10223)--

> explained that she did every assignment on the word processor before she assigned it to the students. She said I want to be able to know any problems that might come up in advance!

Although the teachers could tell by sound whether or not students were working, they could not tell what they were doing or if they were doing it correctly. The common procedure seemed to be that when students needed help, they approached the teacher.

Trade and industrial. The first day of observation for the building trades class (10102) at the inner-city site was cancelled due to a blizzard. The blizzard appeared to affect attendance and performance on the subsequent days of the observation week as well. In the auto mechanics class (20509), the teacher was absent on Friday. So instead of teaching class, the substitute showed a non-subject-related movie for entertainment. As a result, the class was recorded as off task for that day.

When they had class, the teachers in the four trade and industrial classes appeared to work hard most of the time. A common problem, although not consistant every day, was that teachers often started classes late. Buses were frequently late too, which further detracted from opportunities for student time on task. Another common problem was the high noise level in the trades and industrial classes. In one class the observer noted that--

> This class (10222) was extremely noisy, so noisy that the teacher could have no idea if the students were on task, or talking about other things such as movies, clothes, or sports.

The teachers were busy but spent much of the time responding to students' immediate needs. The teachers seemed overwhelmed much of the time and did not seem to be able to keep up with all the students in the class at once. The students waited to be told what to do and did not seem to be able to progress on their own. Although the teachers appeared to be effective with the individual students with whom they were working, they were much less sensitive to the needs of the total class. Students spent much of the class time waiting for the teacher's help or trying to attract his attention. In classes requiring group efforts such as building trades, students in one group spent much time waiting for another group's task to be finished before they could begin. The observer described one class (10102):

> Even with two teachers, students were constantly standing around waiting. They waited to be told what to do next. The teachers had to give instructions for every nail, every board. The teachers were very busy, but it was almost impossible to keep all the students on task.

Thus, while instructors were busy with others, students had many opportunities to socialize and engage in other non-task-related behaviors in several of the classes.

Teachers did not appear to always notice what students were really doing. For example, in one class (10222) the observers noticed that a student was paying the other student at his work station to complete the assigned task. Exams were often completed as group projects although the instructor had specifically stated they were to be done individually.

In all the classes the instructors appeared to know the content well but did not teach it effectively. Most important, it appeared that the teachers did not set clearcut goals for their students. Instead, they kept the students "busy" for the day. The exception was a machine shop class (20305) where the teacher used a competency-based teaching model. The student assignments for completing workbook pages were posted on the board each day and students started to work as soon as they arrived. This strategy was especially effective for this particular class because buses from feeder schools were often late and much time would have been wasted waiting for everyone to arrive.

Some of the teachers also seemed to forget that they were serving as role models for students. They appeared to use the "do as I say not as I do" approach, especially with safety procedures. In one class (10102) two instructors periodically reminded students about wearing hard hats, yet neither teacher ever wore one during the week of observations. Another example was when an instructor did not follow the safety procedures for using ladders. Yet he exected the students to follow the procedures.

Question Two (Secondary)

What are the proportions of time spent by students on task, on breaks, and off task?

The descriptions of the secondary classes paint a picture of hard-working teachers with students only on task when the teachers worked with them directly, or classes where the teachers mostly left students alone to complete work. Notwithstanding, the observers recorded that, on the average, the students were on task more than they were off task. The pie chart displayed in figure 5 shows the proportions of time spent by secondary students on various tasks, on breaks, and off task.

As indicated in figure 4, the secondary students spent, on the average, over two-thirds (71 percent) of their time on tasks, which included basic skills (2.8 percent), employment skills (.7

percent), theory (21.3 percent), practice (37.8 percent), and noncontent (8.5 percent). The students also spent 4.5 percent of the time on scheduled, or mandatory breaks, and 24.1 percent of the time off task.

The proportions of time use varied among the service areas as shown in figures 5 through 7. A further breakdown of secondary student time use is presented in table 10. As shown in table 10, the agriculture classes had the highest proportion of time on task (83.59 percent) in comparison to business and office classes (74.8 percent) and trade and industrial classes (71.02 percent). Business and office classes spent considerably more time on basic skills (6.76 percent) compared to agriculture (.09 percent) and trade and industrial classes (.92 percent). Agriculture classes spent slightly more time on employability skills (1.99 percent) than business and office (.95 percent) or trade and industrial classes (.23 percent).

There was also variation among classes within the same service areas. For example, in the trade and industrial service areas, the machine shop (20305) class spent 79.25 percent of time on task as compared to the auto mechanics (20509) class with 44.82 percent time on task. There was also a considerable difference for time on task between the two agriculture classes (95.92 and 74.91 percent) but fewer differences among the business and office classes (80.96, 76.46, and 61.70 percent). Other variations among classes within the same service are found in the word processing (10223) class, which spent 10.81 percent of time on basic skills and 1.64 percent time on employability skills whereas the other two business and office classes spent no time on either of those activities. Similarly, only that word processing class (10223) spent time on breaks (7.21 percent), whereas neither of the other classes spent any time on scheduled breaks. It should be noted, however, that both of those classes (20407 and 20408) had considerably more time off task (38.52 and 23.18 percent) when compared to the word processing class (11.55 percent). In the other service areas, time spent on breaks did not appear to influence the amount of time off task.

The four classes at Site 1, the inner-city site, had a higher average proportion of time on task (74.77 percent) than the five classes at Site 2, the midsized urban site that had an average of 67.42 percent. Within Site 1, the horticulture class (10101) had the highest proportion of time on task (95.92), as compared to the lowest, the electronics class (10222) with 60.88 percent. Within Site 2, the machine shop (20305) had the highest proportion of time of time on task (79.25) and the auto mechanics class (20509) had the lowest (44.82).

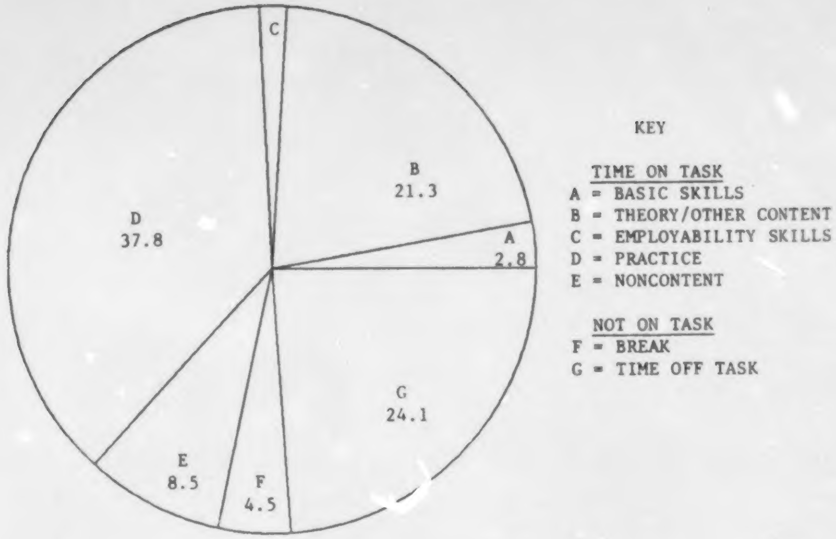

FIGURE 4. PERCENTAGES OF TIME USED IN ALL SECONDARY CLASSES

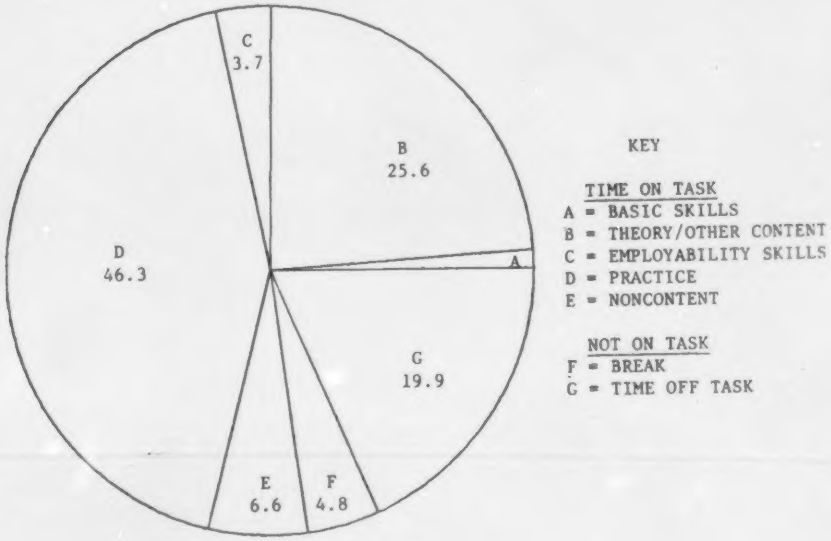

FIGURE 5. PERCENTAGES OF TIME USED IN SECONDARY AGRICULTURE CLASSES

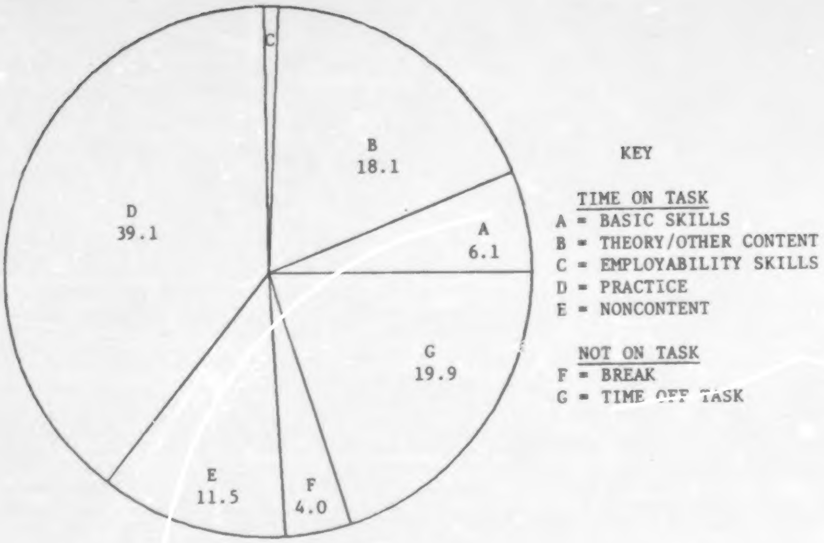

FIGURE 6. PERCENTAGES OF TIME USED IN SECONDARY BUSINESS AND OFFICE CLASSES

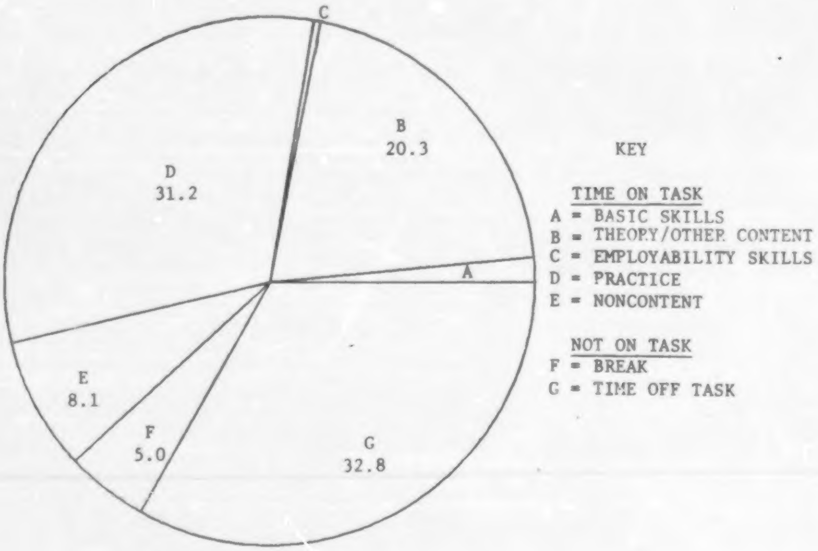

FIGURE 7. PERCENTAGES OF TIME USED IN ALL SECONDARY TRADE AND INDUSTRIAL CLASSES

TABLE 10

PROPORTIONS OF TIME SPENT BY SECONDARY STUDENTS DURING 5,939 MINUTES OF OBSERVATION

Class/ Class Code	Time On Task					Total Time on Task	Time on Break	Time Off Task
	Basic Skills	Employability Skills	Theory	Practice	Noncontent			
			Agriculture					
Horticulture 10101	2.66	3.80	28.47	51.77	9.22	95.92	0.00	7.38
Agriculture 20301	.11	4.27	23.50	42.35	4.68	74.91	8.90	29.14
Average	1.20	3.76	25.63	46.38	6.62	83.59	4.88	19.82
			Business and Office					
Data Processing 20407	0.00	0.00	37.11	12.63	11.96	61.70	0.00	38.52
Typing II 20408	0.00	0.00	3.28	58.12	5.06	76.46	0.00	23.18
Word Processing 10223	10.81	1.64	16.60	38.15	13.76	80.96	7.21	11.55
Average	6.11	.95	18.16	39.11	11.48	75.81	4.88	19.82

TABLE 10
(continued)

Class/ Class Code	Time On Task: Basic Skills	Time On Task: Employability Skills	Time On Task: Theory	Time On Task: Practice	Time On Task: Noncontent	Total Time on Task	Time on Break	Time Off Task
				TRADE AND INDUSTRIAL				
Machine Shop 20305	4.32	1.23	22.66	44.68	6.36	79.25	5.34	12.52
Auto Mechanics 20509	0.00	.02	3.45	31.56	9.79	44.82	6.37	49.06
Building Trades 10102	1.56	0.00	1.02	47.27	11.47	61.32	2.39	36.42
Electronics 10222	0.00	0.00	54.30	1.19	5.39	60.88	5.01	34.16
Average	1.52	.36	20.35	31.16	8.11	61.52	5.05	32.80
Average for all classes	2.80	.65	21.30	37.81	8.48	71.02	4.5	24.10

Question Three (Secondary)

What are the relationships of teacher instructional and managerial behaviors to student time on task?

The three teacher behaviors recorded on a minute-by-minute basis were (1) the level of teacher with-it-ness, (2) the teacher role in interacting with/observing the students, and (3) the specific teaching methods used. Additional variables were qualitatively analyzed from the narrative data. The nine secondary teachers were diverse in their styles and approaches to teaching.

Teacher with-it-ness. Some teachers were more attuned to their students' needs than other teachers, as shown by the level of with-it-ness in table 11. The level of teacher with-it-ness was positively associated with the amount of student time on task. For example, the teacher of the horticulture class (10101) with the highest time on task (95.92 percent) among all the classes was observed to be most (45.6 percent) "with it" or sensitive to all students/sensitive at many levels. In contrast, the teacher of the auto mechanics class (20509) with the lowest time on task (44.82 percent was observed to be far less "with it", with no time spent on the highest level of with-it-ness and more than half of his time on the lowest two levels. Similarly, in the other classes the levels of teacher with-it-ness were inclined to be higher in classes with more time on task and lower in classes with less time on task. Although not completely consistent for all the classes, the trend evidently indicates that the teachers' levels of with-it-ness influenced students to be on or off meaningful tasks in the secondary classes in the study.

Teacher role. The teacher role was a complex variable that captured the type of teacher interaction with students and the amount of teacher observation of students. The observers assessed the type of role, whether the teacher was observing and interacting with students, observing only, in the room and not interacting or observing, or not in the room at all. Unlike the with-it-ness variable, which progressed from most to least with-it-ness, the role variable was categorical, with each role potentially appropriate for a given situation. The data from the teacher role variable, displayed in table 12, did not indicate consistent trends, perhaps because the diverse types of classes required that teachers interact with and observe students in different ways. The mode for most teachers was to observe and interact with a small group or individual, with all but one teacher (typing II, 20408) in that mode about half of the time.

TABLE 11

TEACHER WITH-IT-NESS IN SECONDARY CLASSES

Class/ Class Code	Percent of Time on With-it-ness[1] From Highest Means to Lowest					
	1	2	3	4	5	n/a
Agriculture						
Horticulture 10101	45.6	16.9	12.8	4.3	20.5	0.0
Agriculture 20301	0.1	5.8	21.5	29.1	41.4	2.0
Average	19.6	10.5	17.8	18.5	32.5	1.2
Business and Office						
Word Processing 10223	2.9	23.7	28.3	18.2	18.7	8.2
Data Processing 20407	0.0	2.9	30.7	31.8	32.5	2.1
Typing II 20408	0.0	0.0	10.7	25.4	62.5	1.4
Average	1.6	14.0	25.0	22.7	31.2	5.4
Trade and Industrial						
Building Trades 10102	5.0	26.0	16.4	22.3	30.0	0.2
Electronics 10222	0.0	0.0	9.0	72.3	14.5	4.0
Machine Shop 20305	2.5	16.5	38.0	23.4	28.7	1.1
Auto Mechanics 20509	0.0	0.2	17.0	29.4	31.7	21.6
Average	1.7	9.7	18.2	36.3	26.5	7.6
Average for all classes	6.3	10.9	19.5	28.8	29.1	5.5

[1] With-it-ness is defined as:
1 = Sensitive to all/sensitive to students at many levels
2 = Sensitive to most students' needs
3 = So-so/variable sensitivity to student needs
4 = Not sensitive to most needs
5 = Not sensitive to anyone's needs
n/a= Other/does not apply

TABLE 12

TEACHER ROLE IN SECONDARY CLASSES

Class/ Class Code	Percent of Time on Role[1] From Highest Interaction Means to Lowest 1	2	3	4	5	n/a
			Agriculture			
Horticulture 10101	28.9	45.3	13.1	12.5	0.3	0.0
Agriculture 20301	2.8	51.0	28.3	7.4	10.5	0.0
Average	14.0	48.5	21.8	9.6	6.1	0.0
			Business and Office			
Word Processing 10223	13.0	42.0	29.5	8.0	7.5	0.0
Data Processing 20407	7.9	62.5	11.4	17.5	0.7	0.0
Typing II 20408	5.7	11.8	15.7	56.4	10.4	0.0
Average	10.3	39.9	22.6	20.6	6.7	0.0
			Trade and Industrial			
Building Trades 10102	5.5	81.7	2.7	9.2	.3	.5
Electronics 10222	0.5	86.0	8.9	1.1	3.2	.3
Machine Shop 20305	4.3	58.7	14.8	8.4	12.8	1.0
Auto Mechanics 20509	1.9	53.0	9.3	24.4	11.4	0.0
Average	3.0	67.9	9.5	11.5	7.7	.3
Average for all classes	7.4	56.8	15.5	13.0	7.1	.3

[1] Role is defined as:
1 = Observing all/interacting with all students in class
2 = Observing and interacting with group/individual
3 = Observing activity but not interacting (monitoring)
4 = In room/office but not observing or interacting
5 = Not in room at all
n/a= Other/does not apply

In some classes, the teacher role appeared to have a strong influence on student time on task. For example, in the horticulture class (10101) with 95.94 percent time on task, the teacher was interacting with and observing all students 28.9 percent of the time, by far a greater percent of the time than any other teacher. Conversely, in the auto mechanics class (20509) with only 44.82 percent time on task, the teacher was not observing or interacting when in the classroom (24.4 percent) and was out of the classroom 11.4 percent of the time. The most noticeable exceptions to the relationship of student time on task to teacher observing/interacting was the typing II class (20408) where the teacher was not interacting with nor observing students over half of the time (56.4 percent) and was out of the room 10.4 percent of the time. Yet the students were on task 76.46 percent of the time. Upon further examination, however, it was found that the students were practicing 68.12 percent of the time, the largest proportion of time on practice among all of the classes. Also, the narrative data show that this teacher was extremely well organized and told the students what they were expected to accomplish.

It appears that the teacher role variable was sensitive to the type of secondary class and the type of tasks being done by students. When students had assignments to practice, they stayed on task in classes where goals had been clearly set forth without the continual supervision of the teacher.

Teacher method. Overall, the secondary teachers spent over a third of the time (33.43 percent) providing one-to-one instruction as shown in table 13. The second greatest amount of time (18.91 percent) was spent on miscellaneous methods, breaks, off-task behaviors such as chatting with other teachers, or being out of the room. Teachers spent the next longest amounts of time working on their own or doing paperwork (13.42 percent), observing students (11.81 percent), giving directions, explanations or demonstrations (7.31 percent), and giving tests or inspecting work in progress (5.51 percent). The remaining 10 percent of time was spent lecturing and using audiovisuals (2.78 percent), cleaning up or setting up (2.39 percent), or discussions, or questions and answers (2.21 percent), or announcements or passing out materials (1.70 percent), and for socializing with students (.44 percent).

The methods used by teachers varied with the service area, although there were exceptions among classes within the same service areas. One-to-one instruction was the predominant method (43.99 percent) used by trade and industrial teachers, especially when compared to agriculture teachers (15.81 percent) and business and office teachers (28.94 percent). Further inspection reveals, however, that the data processing (20407) teacher used that method far more (48.92 percent) than the typing II (20408) teacher (7.85 percent). Similarly, the machine shop (20305) teacher used the method far less (34.35 percent) than did the electronics teacher (60.82 percent).

TABLE 13

METHODS USED BY SECONDARY TEACHERS

Class/ Class Code	One-to One	Discuss/ Q-&-A	Social-izing	Lecture/ Audio-Visual	Announce/ Pass Mtls.	Direct/ Demo	Test/ Inspect	Observe	Own Work	Clean-up/ Set-up	Other
					Agriculture						
Hort 10101	20.90	6.80	0.00	14.81	2.93	10.80	19.08	7.98	10.40	.78	5.45
Agri 20301	12.72	2.72	2.38	1.25	1.01	7.62	7.04	28.60	11.02	2.16	23.43
Average	15.81	4.49	1.37	7.61	1.83	8.78	12.56	19.58	10.74	1.56	15.68
					Business and Office						
Data Proc 20407	48.92	5.71	0.00	1.07	0.00	8.57	0.00	8.37	14.28	1.07	11.78
Type II 20408	7.85	1.07	0.00	0.00	2.49	2.50	1.78	7.14	52.14	.71	24.28
Word Proc 10223	29.37	2.32	0.00	.96	0.40	11.38	.27	13.43	22.07	2.61	17.13
Average	28.94	2.79	0.00	.78	.77	8.84	.54	11.02	26.92	1.86	17.53
					Trade and Industrial						
Mach Shop 20305	34.35	.45	.57	0.00	4.32	1.70	.90	17.98	16.09	.91	22.46
Auto Mech 20309	40.99	.11	0.00	0.00	.11	4.64	2.10	.66	5.63	7.07	38.67
Building Trades 10102	42.07	.16	0.00	.33	1.01	19.65	11.08	11.42	3.02	0.00	10.71
Elec-tronics 10222	60.82	2.74	0.00	4.92	2.45	1.50	4.65	3.56	10.27	3.01	5.89
Average	43.99	.83	.16	1.22	2.02	5.94	4.08	8.29	9.16	3.02	21.08
Average For all classes	33.43	2.21	.44	2.78	1.70	7.31	5.51	11.81	13.42	2.39	18.91

TABLE 14

TEACHER METHODS RELATED TO
SECONDARY STUDENT TIME USE

Student Time	Percent of Student Time	F Ratio Probability	Teacher Methods with Highest Means		Teacher Methods With Lowest Means	
Time on Practice	37.81	40.97/ 0.00	Observe	39.26	Lecture/Audiovisuals	4.00
			One-to-One	37.14	Clean Up/Set Up	7.76
			Test/Inspect	31.38		
Time on Theory (includes basic skills and employability skills)	24.73	43.55/ 0.00	Discuss/Q & A	33.47	Clean Up/Set Up	4.74
			One-to-One	26.43	Other	6.79
			Lecture/Audiovisuals	22.72		
Time on Noncontent	8.48	33.39/ 0.00	Clean Up/Set Up	21.58	Lecture/Audiovisuals	.93
Total Time on Task (Includes Practice, Theory, Noncontent)	71.02	50.80/ 0.00	One-to-One	63.47	Other	28.27
			Observe	53.02		
			Test/Inspect	50.47		
			Explain/Demonstrate	46.27		
Total Time off Task (time on break, 4.5 percent, not included)	24.10	35.85/ 0.00	Clean Up/Set Up	40.91	Lecture/Audiovisuals	4.06

The relationships among teacher methods and student time use were revealed through one-way analysis of variance. The highlights from these analyses of the secondary classes are displayed in table 14. The data in table 14 show that the teacher methods of one-to-one instruction, observation, test/inspect, and explain/demonstrate had the highest means for student time on task, whereas the miscellaneous/other category had the lowest. The methods with the highest means for student time on practice were observation, one-to-one instruction, and test/inspect, whereas those with the lowest means were lecture/audiovisuals and set up/clean up. For student time on theory, the highest means were discussion/question and answer, one-to-one instruction and lecture/audiovisuals; the lowest were clean up/set up and "other". It appears that teachers used different methods for theory and practice, with the exception of one-to-one instruction that was pervasive in both.

Not surprisingly, the method with the highest means for student time on noncontent was set up/clean up while the lowest was lecture/audiovisuals. Similarly, the method with the highest means for student time off task was also clean up/set up while lecture/audiovisuals was the lowest. While no causality can be demonstrated, the pattern of relationships between teacher methods and student use of time indicates that certain methods are more conducive than others to eliciting student time on practice or theory, or on task.

The relationships shown in table 13 were similar, with minor exceptions, in the analysis of the service areas. On the class level, the most striking example of nonconformity was the typing II class (20408) with 76.46 percent time on task where the teacher spent the majority of time (52.14 percent) on her own work. Although one-to-one instructing, observing, testing/inspecting, explaining/demonstrating, and lecturing were most associated with student time on practice and theory, a teacher's cleaning up or setting up and the "other" category were least associated with content-related tasks. One conclusion important to vocational educators is that different methods appear to be more useful to maximize student time on practice, a task that engages almost a third of vocational student time, than are useful for student time on theory.

Additional Teacher Behavior Variables

Several additional teacher behaviors that were not recorded on a minute-by-minute basis were noted in narrative form as they occurred. Analysis of these notes indicated that there were differences in individual teacher approaches, style, and philosophy that appeared to be important in student use of time.

The most outstanding of these variables was the teachers ability to define class goals clearly. In many of the secondary classes, teachers did not explain what students, either as a class or as individuals, were expected to accomplish during that period or for a longer time range. One exception was the typing II (20408) teacher who was explicit about the class goals. Her students were on task 76.46 percent of the time despite the fact that she did not supervise them closely. In other classes when teachers did explain what they expected students to do, there was an observable difference in the students as they set up and started to do their assigned tasks. Sometimes the teachers not only explained the goals, but they also wrote group or individual assignments on the chalkboard or posted them on a bulletin board. In the machine shop class (20305), the goals were broken down by specific tasks to be done by specific students by a certain time. Students referred to the posted task assignments frequently and appeared to be better able to continue without further instructions from the teacher. In the building trades class (10102) and electronics class (10222) where no goals were explained or assignments posted, the students were off task for many minutes until the teachers were free to explain the next assignment.

Another important teacher variable was planning and organization of the curriculum. Good planning was not only necessary so teachers could explain the goals more readily to students, it also meant that teachers had the necessary supplies and equipment on hand when they were needed. Thus, students did not have to wait while supplies or equipment were readied during classtime, but could go from task to task with little time lost. In some classes the equipment was old and did not work properly which may or may not have been due to teacher planning. Good planning and organization also meant that teachers could think ahead to prevent potential problems. The word processing teacher (10223) did all of the assignments on each type of word processor in order to anticipate student problems. At the secondary level, teachers were frequently not well organized, which caused them more work during class, especially in the trade and industrial and agriculture classes. Although these teachers hastened to find supplies or prepare equipment, students often waited or socialized because they did not know what to do next or were not motivated enough to work without teacher supervision.

Most of the teachers at the secondary level did not appear to maximize class time deliberately. While teachers worked hard in several classes to keep up with individual student needs, they did not appear to try to make use of all the class time available for relevant tasks. Teachers opened doors five to ten minutes after the class bell had rung in a few instances. In several classes teachers waited to call roll or start class because buses were up to thirty minutes late. The majority of the teachers did not start class as soon as the bell rang. Instead, they chatted with students, organized supplies, and waited until everyone settled down or arrived in class. One exception was the teacher who had students start individual assignments until everyone arrived by bus, which usually took fifteen to twenty minutes after class officially started. That class had a higher proportion of time on task than others where the teacher waited. In some classes teachers started clean up thirty minutes before the end of the class. Even the messiest tasks did not require that an entire class spend much time cleaning on a daily basis. A large proportion of the daily time off task occurred during the clean up time as well as during the first minutes of class.

The teachers who were observed in the secondary classes appeared to have the necessary content knowledge and skill proficiency to earn their students' respect. The major problem was, however, that instead of teaching the students general skills so they could be more independent, some teachers taught each task one step at a time to individual students. Consequently, many students waited for their turn for instruction rather than proceding on their own. Teachers appeared to use too much one-to-one instruction as opposed to demonstrating and explaining skills to the whole class or small groups. As a result, although teachers may have known the content and had the skills, many of them did not use them to advantage.

Some of the teachers at the secondary level were models of the work ethic. These teachers appeared motivated, involved, and busy with meaningful tasks, and they related class work to the world of work when appropriate. One observer commented that a word processing teacher (10223)

> was an excellent role model. Her dress was appropriate for the classroom or for working in an office. She often stressed the importance of the skills necessary to get a job, not just being able to type, but also language arts skills, how to write a vita, and how to act in an interview.

Observers noted that other teachers sometimes emphasized safety precautions but did not follow these themselves. Because the observations lasted only a week, the observers found it somewhat difficult to relate the work ethic modeling to student time use. However, teachers that were good models of the work ethic appeared to exhibit other behaviors that related to student time use. It appeared that teachers with good work habits and a professional manner elicited better work habits from their students.

Finally, providing positive reinforcement appeared to motivate students more than teacher criticism or anger. One teacher was tense and upset when his repeated explanations did not seem to help students understand what was expected. Consequently, the students were afraid to try on their own, and wasted much time waiting for individual help. In classes where the teacher made positive comments frequently, for example, a word processing class (10223), students appeared more eager to work and to risk trying new tasks without help.

The variables described in this section were not the only teacher behaviors that appeared to relate to student use of time. They were the most outstanding and occurred most frequently during the 5,938 minutes observed in the secondary classes. It was therefore concluded that although not all relevant teacher instructional/managerial behaviors may have been determined, these seven provide a wealth of information for evaluators, supervisors, and teacher educators.

Question Four (Secondary)

> What are the relationships of classroom variables to student time on task?

The grouping variable, interruptions, disruptions, and absence were the classroom variables investigated relative to student time on task. The grouping variable proved to be most useful in explaining student time on task.

Grouping. As explained in chapter 3, grouping is a collapsed variable that provides a picture of how students were dispersed and whether they were engaged in the same or different types of tasks. As shown in table 15, the predominant (49%) type of grouping in secondary classes was Group 2 where the students were in one room and were working on various tasks in small groups or individually. Students were in Group 1 (in more than one room working on various tasks) 31 percent of the time while they were in Group 4 (in one room working on same task) about 18 percent of the time. Very few (less than 2 percent) moments were spent on Group 3 (in more than one room working on same task).

The data in table 15 further indicate that grouping differed by service areas. For example, while business and office classes were in Group 2 most often (84 percent), the agriculture classes were only in that mode 8 percent of the time. The predominant mode in agriculture classes was Group 1 (55 percent) although they were also in Group 4 36 percent of the time. Trade and industrial classes were mostly in Group 2 (55 percent), though they spent almost a third (31 percent) of the time in Group 1.

The grouping of students was dictated by the configuration of rooms assigned to the classes, by the nature of the tasks assigned, and by the specific assignments made by the teacher. In turn, the grouping of students dictated the teacher role, teacher methods, and level of teacher with-it-ness necessary for effective use of student time. Some of the teachers controlled the students movements very strictly. Others did not seem to mind when students disappeared from their view for long periods of

TABLE 15

DISTRIBUTION BY GROUPING[1] OF SECONDARY CLASSES

Service Area	Group 1 Number Minutes	Group 1 Percent of Total	Group 2 Number Minutes	Group 2 Percent of Total	Group 3 Number Minutes	Group 3 Percent of Total	Group 4 Number Minutes	Group 4 Percent of Total
Agricultural Education	695	55%	101	8%	none		459	36%
Business and Office Education	34	3%	891	84%	none		113	10%
Trade and Industrial Education	774	31%	1338	55%	none		293	12%
All service areas	1503	31%	2330	49%	Less than 2% - too few to consider		865	18%

[1] The grouping variable is a combination of student dispersement and grouping. The four combinations derived statistically were:

Group 1 = Students are in two or more adjoining rooms and are working individually or in small groups and various content.
Group 2 = Students are in one room and are working individually or in small groups on various content.
Group 3 = Students are in two or more adjoining rooms but are working as a class on one content area.
Group 4 = Students are in one room and are working as a class on one content area.

time. *The teacher's ability to interact with all the students did not appear to be as important to student time on task as did the students knowing what the teacher expected them to accomplish and that they would indeed be accountable for those tasks*. It was important that students know what to do next on their own, especially in the Group 1 mode where the variety of tasks being performed simultaneously in different rooms could easily lead to confusion.

As described earlier, a major reason students were off task in secondary classes was that they did not know what to do after they accomplished a specific assignment. Consequently, they would either pretend to work at a task, socialize, wander about the room, go to the restrooms, or just wait until the teacher got back to tell them what to do next. It seemed to the observers that if the students had been given more of an overview of the whole task to accomplish and had been taught the basics of doing a range of tasks, then they could have proceeded without needing further instructions. Because students had to be in various rooms to accomplish assignments, their grouping was the key to teacher behavior. Teachers who appeared to respond to the student grouping had appropriate types of interaction, had the level of with-it-ness necessary, and used appropriate methods. For example, the typing teacher who mostly worked on her own work but was tuned in to students' needs (with-it-ness) and had clearly defined the goals, elicited the highest proportions of task time from students in a typing class who were in one room doing one task.

Disruptions and interruptions. In the literature, interruptions and disruptions are major deterrents to time on task in academic classrooms. In the vocational classrooms observed, however, neither interruptions (from outside the classroom) or disruptions (from within the classroom) appeared to make a significant difference to student time on task. On the average, in all the secondary classes, there were more interruptions (5.2 percent) than disruptions (1.4 percent) as shown in table 16. The observers noted that the interruptions from announcements, people walking into the classroom, telephones ringing, and so forth rarely caused the majority of students who were engaged in tasks to stop. The exception was when other students came in to talk to students in the class who then stopped their work. Similarly, disruptions, such as two students joking loudly or arguing, were relatively infrequent except in the agriculture classes (4.2 percent) and did not appear to dissuade students from remaining on task for very long periods of time. It is interesting to note that the class with the highest proportion of time on task, horticulture (10101), also had the most time for disruptions and interruptions (3.2 and 11.2 percent).

TABLE 16

DISRUPTIONS AND INTERRUPTIONS IN SECONDARY CLASSES

Class/ Class Code	Percent of Time on Disruptions (from within class)	Percent of Time on Interruptions (from outside class)
	Agriculture	
Horticulture 10101	3.2	11.2
Agriculture 20301	4.9	5.0
Average	4.2	7.7
	Business and Office	
Word Processing 10223	0.8	4.4
Data Processing 20407	0.0	6.1
Typing II 20408	0.0	4.6
Average	0.5	4.8
	Trade and Industrial	
Building Trades 10102	0.5	4.0
Electronics 10222	1.1	3.8
Machine Shop 20305	0.5	7.4
Auto Mechanics 20509	0.0	1.0
Average	.5	4.0
Average for all classes	1.4	5.2

One conclusion about the impact of disruptions and interruptions is that since so many activities typically occurred in the vocational classes, students who were motivated to be on task did not take much notice of disruptions or interruptions. Another conclusion is that while students did appear to be on task, there was no way to assess the quality of their engagement. For example, students could easily glance up to see someone walk into the room or listen to an announcement while continuing to do many tasks such as potting plants, sweeping a floor, sanding an object, and even running a lathe.

Disruptions and interruptions did, however, make a difference to the individual students involved. When a student from another class came to chat with a student, the individual would stop working. When two students were arguing, they obviously were not on task. As a result of these observations, a third conclusion is that although disruptions and interruptions may not affect most of the students (as they apparently do in academic classes), they cannot be disregarded as important deterrents to individual student time on task. The observers noted that some teachers were able to hold disruptions and interruptions to a minimum by keeping classroom doors closed, by keeping other students out except during breaks, by having class rules regarding restroom breaks, and by immediately reprimanding students who got too noisy.

Absence. Overall, students were absent from their classes almost 33 percent of the time as shown in table 17. Absence was calculated to include all the minutes students were late to the class, left early from the class, and did not come to class at all. The number of student minutes present was divided by the number of student minutes enrolled. The rate of absence was much higher than reported in the previous study where the average was 18.4 percent. One factor was that the observations at Site 1 occurred during a major winter snowstorm. While school was not officially closed, very few teachers and students were present during the first week of observations. Although attendance increased during the second week, the teachers still reported that they normally had fewer students absent than were recorded during that week.

The rate of absence appeared to make some difference in time on task in at least one class. The horticulture class (10101) with the highest time on task (95.2 percent) of all classes only had eleven students enrolled, and of these, 2, 3, 6, 7, and 4 students attended during the week of observation. Perhaps the high time on task was due to the very few students with which the teacher had to work. There was no clearcut relationship between absence and time on task, however. Both the word processing class (10223) and the machine shop (20305) had about 80 percent time on task and had a fairly low rate of absence.

TABLE 17

PERCENT OF STUDENTS ABSENT IN SECONDARY CLASSES

Class/ Class Code	Percent Time on Task	Percent Absent
	Agriculture	
Horticulture 10101	95.92	53.94
Agriculture 20301	74.91	59.81
Average	83.59	56.05
	Business and Office	
Word Processing 10223	80.96	25.31
Data Processing 20407	61.70	31.00
Typing II 20408	76.46	24.71
Average	75.81	26.86
	Trade and Industrial	
Electronics 10222	60.88	12.69
Machine Shop 20305	79.25	31.80
Auto Mechanics 20509	44.82	31.65
Building Trades 10102	61.32	33.61
Average	61.57	27.44
Average for all classes	71.02	32.53

The observers noted that in classes where students appeared to depend upon their teachers for step-by-step assignments, higher rates of time on task appeared to occur when there were fewer students present. It can be concluded that absence was a critical factor in classes where students worked as individuals or in small groups and did not know how to proceed without explicit next-step instructions from their teachers.

Question Five (Secondary)

What is the relationship among student use of time, teacher instructional/managerial behaviors, and classroom variables?

When examined separately, each teacher and classroom variable appeared to be associated to some degree with student time on task. Since causal and predictive analyses could not be conducted with the nonrandomly selected observational data, profiles were compiled to portray patterns of the relationships among the variables. In table 18, the teacher methods are juxtaposed with student time use, dominant teacher role, dominant teacher with-it-ness and dominant student grouping. (The predominant student time use is underlined for each method.) Tables 19, 20, and 21 present profiles for each of the secondary service areas. As shown in table 18, the most frequently used teacher method (one-to-one instruction) occurred most often when students were practicing (43.3 percent), the teacher role was to observe and interact with a group or individual, the teacher's with-it-ness was at a level not sensitive to most students, and the students were located in one room and working on tasks in small groups or as individuals. Although this pattern was similar for the service areas as shown in tables 19, 20, and 21, the teachers were observed to be more "with it" (Level 1) in the agriculture classes, perhaps because the students were more scattered (Group 1) and had to be monitored more closely.

The second most frequent teacher method (18.9 percent) included miscellaneous out-of-room teacher behaviors. Again, although not consistent across all service areas, the average pattern was that students were off task, teachers were not observing and interacting or they were out of the room, teachers were not at all sensitive to student needs, and students were located in more than one room while assigned to work on various tasks.

Teachers working on their own (13.4 percent of the time) had diverse relationships to student time. For the average of all classes, students practiced most frequently when teachers were

TABLE 18

PROFILE OF ALL SECONDARY CLASSES: TEACHER METHOD, ROLE, WITH-IT-NESS BY STUDENT TIME AND GROUPING

Teacher Method	Total Minutes on Method	Percent of Student Time[1]				Dominant Teacher Role[2]	Dominant Teacher With-it-ness[3]	Dominant Student Group[4]
		Theory	Practice	Non-Content	Off Task			
1. One-to-one instruction	1948	26.4	43.3	6.1	23.8	2	4	2
2. Discussion/questions and answers	131	68.7	17.5	6.2	7.5	1	3	4
3. Socialize	26	26.1	25.5	1.3	47.1	2	4	1
4. Lecture/audio visual	164	87.0	2.2	.9	10.1	1	3	4
5. Announce/pass materials	101	21.8	37.3	10.2	34.7	1	4	1
6. Clean up/set up	142	4.4	8.2	20.2	67.2	3	5,4	2
7. Explain directions/demonstrate	434	28.3	29.7	18.2	21.3	2	3	2
8. Test/inspect work	327	17.0	45.8	15.9	21.8	2	4	2
9. Observe	700	26.0	43.2	6.2	23.0	3	4,3	1
10. Work on own/paperwork	780	24.8	40.6	6.6	24.2	4	5,4	2
11. Other/break/out of room	1103	7.7	25.4	9.2	38.4	4,5	5	1
Total minutes observed 5938								

[1] Rows do not add to 100 percent because time on break is not included in this analysis

[2] Role:
1=Observing all/interacting with all students
2=Observing/interacting with group/individual
3=Observing activity but not interacting
4=In room/office but not observing/interacting
5=Not in room at all

[3] With-it-ness:
1=Sensitive to all/sensitive at many levels
2=Sensitive to most needs
3=So-so/variable sensitivity to needs
4=Not sensitive to most students
5=Not sensitive at all

[4] Group:
1=Students in more than one room working on various tasks
2=Students in one room working on various tasks
3=Students in more than one room working on same task
4=Students in one room working on same task

TABLE 19

PROFILE OF ALL SECONDARY AGRICULTURE CLASSES: TEACHER METHOD, ROLE, WITH-IT-NESS BY STUDENT TIME AND GROUPING

Teacher Method	Total Minutes on Method	Percent of Student Time[1] Theory	Percent of Student Time[1] Practice	Percent of Student Time[1] Non-Content	Percent of Student Time[1] Off Task	Dominant Teacher Role[2]	Dominant Teacher With-it-ness[3]	Dominant Student Group[4]
1. One-to-one instruction	243	20.5	68.1	4.1	8.3	2	1	1
2. Discussion/questions and answers	69	63.6	15.0	10.6	10.3	1	1	4
3. Socialize	21	22.3	26.3	0.0	51.4	2	4	1
4. Lecture/audio visual	116	86.4	1.8	.7	11.4	1	3,5	4
5. Announce/pass materials	28	24.1	28.[illegible]	10.7	51.4	1	5,4	4
6. Clean up/set up	24	4.9	6.3	26.6	62.2	2	5,3	4
7. Explain directions/demonstrate	135	29.8	47.9	8.0	13.5	2	4,1	1,4
8. Test/inspect work	193	14.5	59.5	17.3	10.3	2	1	1
9. Observe	301	22.7	48.3	5.7	23.5	3	4	1
10. Work on own/paperwork	165	30.0	36.5	3.3	30.3	4	5	1,4
11. Other/break/out of room	241	10.0	34.0	3.0	27.1	5,3	5	1
Total minutes observed 1536								

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[1] Rows do not add to 100 percent because time on break is not included in this analysis

[2] Role:
1=Observing all/interacting with all students
2=Observing/interacting with group/individual
3=Observing activity but not interacting
4=In room/office but not observing/interacting
5=Not in room at all

[3] With-it-ness:
1=Sensitive to all/sensitive at many levels
2=Sensitive to most needs
3=So-so/variable sensitivity to needs
4=Not sensitive to most students
5=Not sensitive at all

[4] Group:
1=Students in more than one room working on various tasks
2=Students in one room working on various tasks
3=Students in more than one room working on same task
4=Students in one room working on same task

TABLE 20

PROFILE OF ALL SECONDARY BUSINESS AND OFFICE CLASSES: TEACHER METHOD, ROLE, WITH-IT-NESS BY STUDENT TIME AND GROUPING

Teacher Method	Total Minutes on Method	Percent of Student Time[1]				Dominant Teacher Role[2]	Dominant Teacher With-it-ness[3]	Dominant Student Group[4]
		Theory	Practice	Non-Content	Off Task			
1. One-to-one instruction	373	27.8	46.4	6.3	18.0	2	4	2
2. Discussion/questions and answers	36	70.1	23.0	1.4	5.2	1	3	4
3. Socialize	0	0.0	0.0	0.0	0.0	0	0	0
4. Lecture/audio visual	5	96.9	0.0	0.0	3.1	1	3	4
5. Announce/pass materials	10	10.0	71.3	2.4	16.3	2	3	2
6. Clean up/set up	24	2.9	8.7	9.5	78.9	3	5	2
7. Explain directions/demonstrate	114	49.3	12.4	17.4	19.9	2	3,2	2
8. Test/inspect work	7	41.8	3.3	3.8	51.1	3	3	2
9. Observe	142	38.8	34.8	7.1	19.3	3	3	2
10. Work on own/paperwork	347	15.7	55.5	6.5	15.1	4	5	2
11. Other/break/out of room	226	7.2	25.3	30.0	26.9	5,4	5	2

Total minutes observed 1284

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[1] Rows do not add to 100 percent because time on break is not included in this analysis

[2] Role:
1=Observing all/interacting with all students
2=Observing/interacting with group/individual
3=Observing activity but not interacting
4=In room/office but not observing/interacting
5=Not in room at all

[3] With-it-ness:
1=Sensitive to all/sensitive at many levels
2=Sensitive to most needs
3=So-so/variable sensitivity to needs
4=Not sensitive to most students
5=Not sensitive at all

[4] Group:
1=Students in more than one room working on various tasks
2=Students in one room working on various tasks
3=Students in more than one room working on same task
4=Students in one room working on same task

TABLE 21

PROFILE OF ALL SECONDARY TRADE AND INDUSTRIAL CLASSES: TEACHER METHOD, ROLE, WITH-IT-NESS BY STUDENT TIME AND GROUPING

Teacher Method	Total Minutes on Method	Percent of Student Time[1]				Dominant Teacher Role[2]	Dominant Teacher With-it-ness[3]	Dominant Student Group[4]
		Theory	Practice	Non-Content	Off Task			
1. One-to-one instruction	1369	27.1	38.1	6.3	28.1	2	4	2
2. Discussion/questions and answers	26	80.1	16.4	1.0	2.6	2	3	2
3. Socialize	5	42.2	22.2	6.7	28.9	2	4	1
4. Lecture/audio visual	38	86.9	3.5	1.8	7.8	2	3	2
5. Announce/pass materials	63	22.7	36.0	11.2	30.2	2	4	1
6. Clean up/set up	94	4.7	8.6	21.2	65.5	2	5	2
7. Explain directions/demonstrate	185	14.2	27.1	26.3	27.9	2	2	2,4
8. Test/inspect work	127	19.4	27.3	14.5	37.6	2	4	2
9. Observe	258	22.8	42.0	6.3	24.8	3	2,4	1
10. Work on own/paperwork	285	31.4	22.8	9.0	31.1	4,3	5	1
11. Other/break/out of room	656	7.0	21.7	4.3	45.4	4	5	1,4

Total minutes observed 3106

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[1] Rows do not add to 100 percent because time on break is not included in this analysis

[2] Role:
1=Observing all/interacting with all students
2=Observing/interacting with group/individual
3=Observing activity but not interacting
4=In room/office but not observing/interacting
5=Not in room at all

[3] With-it-ness:
1=Sensitive to all/sensitive at many levels
2=Sensitive to most needs
3=So-so/variable sensitivity to needs
4=Not sensitive to most students
5=Not sensitive at all

[4] Group:
1=Students in more than one room working on various tasks
2=Students in one room working on various tasks
3=Students in more than one room working on same task
4=Students in one room working on same task

doing their own work. In trade and industrial classes they were either on theory or off task, and in agriculture classes they were on theory, practice, or off task. The dominant teacher role was consistently to be in the room but not observing or interacting, and the teachers were not all sensitive to student needs. The student grouping was not consistent among the service areas, although teachers appeared to do their own work most often when students were in one room working on various tasks.

Teachers observed students (11.8 percent of the time) most frequently when they were practicing, although in business and office classes they observed slightly more when students were engaged in theory-related tasks. When teachers observed, their role was also recorded as observing but not interacting and their levels of sensitivity fluctuated from variable sensitivity to not sensitive to all student needs. With the exception of the business and office classes (Group 1), teachers used the observation method when students were in several rooms working on various tasks.

Each teacher method can be similarly analyzed by reading across by method in tables 18 through 21. Analysis of teacher method reveals reasonable and expected patterns, especially when considering the types of instruction generally found in specific service areas. By reading the same tables down by student time use, teacher role, teacher with-it-ness, and student grouping, other patterns emerge. For example, there are no dominant teacher methods for student time on noncontent relative to other student time use. As discussed previously, student time on theory appears to be associated with lecture/audiovisuals, discussion/question and answer, and explaining/demonstrating. Student time on practice appears to be related to one-to-one instruction, testing/inspecting work, observing, making announcements, working on own, and explaining/demonstrating. Student time off task appears to be related to the teacher's methods of socializing, making announcements and passing out materials, cleaning up/setting up, and "other"/out of room.

Findings and Conclusions Related to Postsecondary Student Time Use, Teacher Behaviors, and Classroom Variables

The same questions that drove the analysis of the secondary data were used to analyze the postsecondary data.

Question One (Postsecondary)

> What are the characteristics of the classes included in the study?

The sixteen postsecondary classes observed in the study were located in two institutions at two sites. Site 1 was a suburban area adjacent to one of the secondary sites, the inner city of a diverse industrial metropolis. The economy of this suburb was dependent upon the metropolitan area. Site 2, the other secondary site, was the same medium-sized service-oriented city surrounded by prosperous farms. The characteristics of these two postsecondary sites are displayed in table 22. As shown in table 22, there were nine business and office, one agriculture, one trade and industrial, and five technical classes.

Since classes at Site 1 only met once a week, there were more classes observed at that site than at Site 2. At Site 2 each class was observed for a full week, while at Site 1 most classes were observed twice, once each in the two non-consecutive weeks of observation. The classes ranged in length from 65 minutes to 180 minutes or three hours. Eleven of the sixteen classes were 150 to 180 minutes long. The four shortest classes were in the business and office service area at the adult education area technical institution.

As shown in table 23, the total enrollment in all the classes was 328 students. The majority (15 percent) of the students were white and female (53 percent). The females were concentrated in the business and office classes, whereas males were concentrated in the remaining types of classes. Four teachers said there were handicapped students in their classes, although the handicaps were not observable in most cases.

None of the teachers represented a minority group as shown table 24. Although it appears that there was an even split between male and female teachers, one male teacher taught four of the classes observed, whereas a female teacher taught three.

TABLE 22

CHARACTERISTICS OF POSTSECONDARY CLASSES

Class/ Class Code	Type of School	Type of Community	Length of Each Class	Total Number of Classes Observed	Type of Curriculum
		Agriculture			
Pest and Diseases (10706)	Community College	Suburban	150	2	Noncompetency based
		Business and Office			
Data Entry (20818)	Adult Ed Technical	Midsized urban	65	5	Locally developed competency based
Beg Word Processing (10710)	Community College	Suburban	120	1	Individualized and competency based
Beg Word Processing (20810)	Adult Ed Technical	Midsized urban	70	5	Noncompetency based
Intro Typing (10711)	Community College	Suburban	150	1	Noncompetency based
Typing II (10708)	Community College	Suburban	170	3	Noncompetency based
Adv Typing (10712)	Community College	Suburban	180	2	Noncompetency based
Shorthand and Typing (20823)	Adult Ed Technical	Midsized urban	80	5	Competency based
Court Reporting (10713)	Community College	Suburban	180	2	Noncompetency based
Accounting (20817)	Adult Ed Technical	Midsized urban	80	5	Competency based
		Technical			
Electronics (20819)	Adult Ed Technical	Midsized urban	150	5	State developed competency based
AC Fundamentals (10720)	Community College	Suburban	150	2	Noncompetency based
AC Fundamentals 10724	Community College	Suburban	150	2	Noncompetency based
AC-Lab (10725)	Community College	Suburban	150	2	Noncompetency based

TABLE 22 (Continued)

Class/ Class Code	Type of School	Type of Community	Length of Each Class	Total Number of Classes Observed	Type of Curriculum
Refrigeration (10716)	Community College	Suburban	150	2	Noncompetency based
		Trade and Industrial			
Machine Shop (20805)	Adult Ed Technical	Midsize urban	166	5	Competency based

TABLE 23

ENROLLMENT IN POSTSECONDARY CLASSES

Class/ Class Code	Total Enrollment	Minority	White	Male	Female	Handi-capped
			Agriculture			
Pests and Diseases (10706)	36	4	32	30	6	No
			Business and Office			
Data Entry (20818)	10	4	6	0	10	No
Beg Word Processing (10710)	17	5	12	1	16	Yes
Beg Word Processing (20810)	16*	3	13	1	15	Yes
Intro Typing (10711)	27	2	25	1	26	
Typing II (10708)	23	3	20	0	23	No
Adv Typing (10712)	15	1	14	0	15	No
Shorthand and Typing (20823)	18	4	14	1	17	No
Court Reporting (10713)	23	0	23	0	23	No
Accounting (20817)	20	9	11	4	16	Yes
			Technical			
Electronics (20819)	23	2	21	21	2	No
AC Fundamentals (10720)	27	2	25	24	3	No
Ac Fundamentals (10724)	27	2	25	24	3	No
AC-Lab (10725)	12	1	11	11	1	No
Refrigeration (10716)	19	7	12	19	0	Yes

TABLE 23
(continued)

Class/ Class Code	Total Enrollment	Minority	White	Male	Female	Handi- capped
			Trade and Industrial			
Mach Shop (20805)	27[1]	1	26	27	0	No
Total	328	49	279	153	175	

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[1] Class was open entry/open exit. Numbers reported were the number observed.

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TABLE 24

TEACHER CHARACTERISTICS IN POSTSECONDARY CLASSES

Class/ Class Code	Minority	Sex	Years Experience In Education	Years Experience In Industry	Teach Same Class More Than Once a Day
			Agriculture		
Pests & Diseases (10706)	No	M	2	12	No
			Business and Office		
Data Entry (20818)	No	F	7	5	Yes
Beg Word Processing (10710)	No	F	16	10	Yes
Beg Word Processing (20810)	No	F	5	2	No
Intro Typing (10711)	No	F	7	6	No
Typing II (10708)	No	F	22	5	No
Adv Typing (10712)	No	F	17	6	No
Shorthand and Typing (20823)	No	F	25	2	Yes
Court Reporting (10713)	No	M	5	20	No
Accounting (20817)	No	F	5	5	Yes
			Technical		
Electronics (20819)	No	M	19	20	No
AC Fundamentals (10720)	No	M	15	15	No
AC Fundamentals (10724)	No	M	15	15	No
AC-Lab (10725)	No	M	15	15	No
Refrigeration (10716)	No	M	2	18	No
			Trade and Industrial		
Machine Shop (20805)	No	M	20	12	No

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All but one of the business and office teachers were female with the exception of the court reporting (10713) teacher. The teachers at the community college located in Site 1 had more years (mean = 12.2 years) of experience in industry than their counterparts at the Site 2 adult education technical institution (mean = 7.6 years). On the other hand, teachers at Site 2 had slightly more (mean = 13.5 years) experience in education than the teachers at Site 1 (mean = 12.6 years). About half of the teachers at Site 1 taught part-time while maintaining their full-time job in industry, whereas all of the teachers at Site 2 taught full-time and did not hold a second job with industry.

Business and office service area. Students in the postsecondary business and office classes seemed to know what they were to do and began working as soon as they arrived. Teachers walked in and out of the classrooms without noticeably affecting student time on task. Observers noted that students were apparently accustomed to interruptions since ringing phones, phone conversations, ringing timers, and visits from outside students did not seem to break the work flow.

Many of the teachers appeared to communicate class goals to the students very clearly and effectively. The goals were generally written on the chalkboard, reinforced verbally, or provided in students' handouts. One observer made the following notation about an advanced typing class (10712):

> The beginning of the class was especially effective. Teacher's directions were clear, goals were stressed, checks were made on student performance, and feedback was provided in positive ways.

This teacher continually challenged students to do better even if they had reached the goals required to earn an "A." She told the students that she would provide their highest timed typing score when asked by employers for recommendations. Even though the students had met the class goals, it was to their personal advantage to do even better, and thus many tried to improve their scores. Since the teacher provided much positive feedback, there appeared to be a sense of healthy competition rather than frustration among the students.

One word processing classroom (10710) was divided into many small carrels that provided an ideal environment for individual learning. The program was individualized and competency based. A teacher and two lab assistants circulated around the room to provide help or directions. They appeared to be "at the right place at the right time" to help students when they needed assistance. In the court reporting class (10713), the teacher was also sensitive to the needs of individual students and provided positive feedback when dealing with the whole class.

However, when he was evaluating individual students' ability to record proceedings, he was less sensitive to others in the class and did not give assignments to them. Thus, most students had "down time" while waiting their turns because they did not have other projects to do.

Teachers in the business and office service area did not use a wide variety of teaching methods. On a few occasions they used transparencies and class discussion to stress key points, but the emphasis was on individual practice. Most of the teachers circulated to help students with individual problems. The observer's notes indicated

> the teacher (20810) continues to move around the room to help students. Students are all doing different tasks specified in the modules. The teacher's constant movement helps her identify students' problems and also keeps the students on task.

In the accounting class (20817),however, the teacher sat at her desk and waited for students to ask for help. The teacher seemed shy and rarely approached students, but was very friendly when they did ask for help. The students used competency based workbooks and were all at different places in the curriculum. Although any whole group instruction may have been virtually impossible, the class seemed very boring to the students. Several students dozed during class from time to time, waking up only when the teacher moved to their part of the classroom. For the most part, however, the business and office classes were on task most of the time. The teachers were enthusiastic and knowledgeable, and served as excellent role models. They integrated information from the world of work into their lectures and discussions which made the instruction more relevant for students. The court reporting (10713) teacher was quoted by an observed as saying,

> wait 'til you try hearing a word in court when the witness is tapping his foot, the court clerk is clipping his fingernails, and the judge is pouring water in his glass behind you--it sounds like Niagara Falls!

Other service areas. The teachers in the other service areas had somewhat different approaches to teaching. In the lecture-oriented AC fundamentals classes (10720 and 10724), the teacher was outstanding. An observer made the following comments:

> The teacher has excellent knowledge of the material. The material is theoretical, but the teacher cites frequent applications of the principles and concepts as reflected in their more practical usage. The teacher is careful to point out new concepts and draws many diagrams to illustrate them. The teacher often asks students if they have any questions, and provides much positive reinforcement to encourage creative thinking.

> While the classes are long, the teacher is very active and challenges the students to stay with him.

Similarly, the teacher in the agriculture class (10706) spent most of the time writing on the board and explaining while the students took notes. Students frequently asked questions that the teacher took time to answer. An observer noted

> there is a good deal of work-related information provided by the teacher and the students. Most of the students appear to work. As a result, they cite real world examples and problems which the teacher uses to reinforce his lecture.

He also used slides and examples to demonstrate key points, such as samples of bark from diseased trees. Throughout the class, several students chatted quietly from time to time although in general their interest appeared to be high. The chatting may have been due to the seating arrangements, with students sitting two to a drafting table.

The room arrangement in the electronics class (20819) presented similar opportunities for socializing. The class was located in a temporary room while the permanent room was being remodeled. Students worked in small groups at stations which promoted considerable interaction among students, although much that was overheard by the observers was related to the electricity experiments they were conducting. In that class, the teacher's presence seemed to distract students. He chatted about baseball and other non-electronic related topics. When he read a book at a desk in front of the room, the students were on task a greater proportion of the time.

In the machine shop (20805) each student was assigned a card describing the task to be performed. The cards were displayed on a board in the shop that kept individual's goals prominent and explicit. The students seemed to use this board as a meeting place, however, and frequently congregated there to chat for several minutes at a time. The teacher was aware of this ploy and disbanded them with "come on fellas, back to work now."

In many of the postsecondary shop or laboratory classes, the most common practice was that the teacher or assistants were available to help students at their request. As the teachers circulated, they pointed out student errors as they occurred rather than wait for work to be handed in for grading. This immediate feedback seemed to prevent students from learning or practicing incorrect procedures. An observer noted that in the AC Fundamentals laboratory (10725)

> the teacher does an excellent job of explaining problems to the students. He frequently uses the chalkboard to

> draw diagrams and asks relevant questions that probe students' minds for understanding.

In most classes the teachers' movements seemed to set the level of intensity of the class. When the teacher was active, busy with students or other work, then the students were more active as well. Although the quality of their work could not be judged from the observations, students appeared to work harder when their teachers worked hard. However, the teachers effect was not as great as it was in secondary classes. Students in post-secondary classes appeared motivated internally as opposed to trying to please the teacher or to avoid censure.

Question Two (Postsecondary)

What are the proportions of time spent by students on task, on breaks, and off task?

The analyses of the time spent in postsecondary classes indicate that students spent most of their class time on task, whether or not teachers were supervising them closely. The pie chart (figure 8) shows the average proportions of time spent by postsecondary students on task, on breaks, and off task.

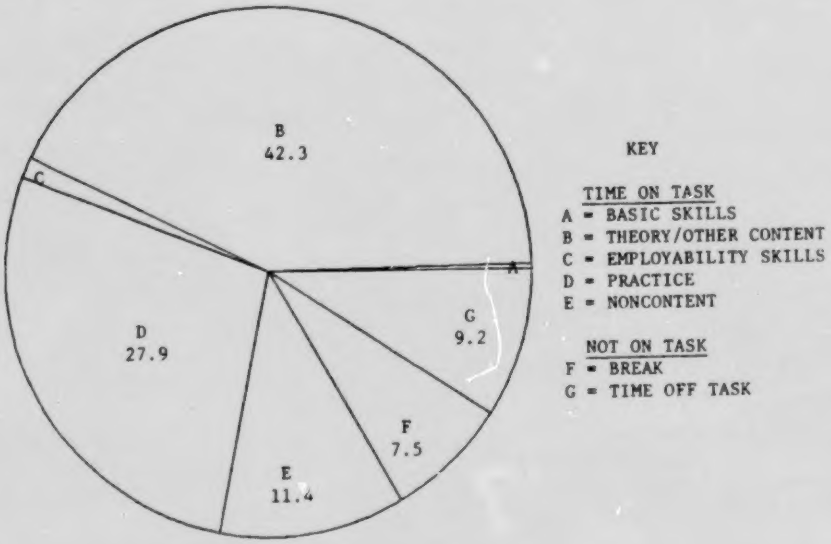

FIGURE 8. PERCENTAGES OF TIME USED IN ALL POSTSECONDARY CLASSES

As shown in figure 8, the postsecondary students spent about four-fifths of their time on tasks that included basic skills

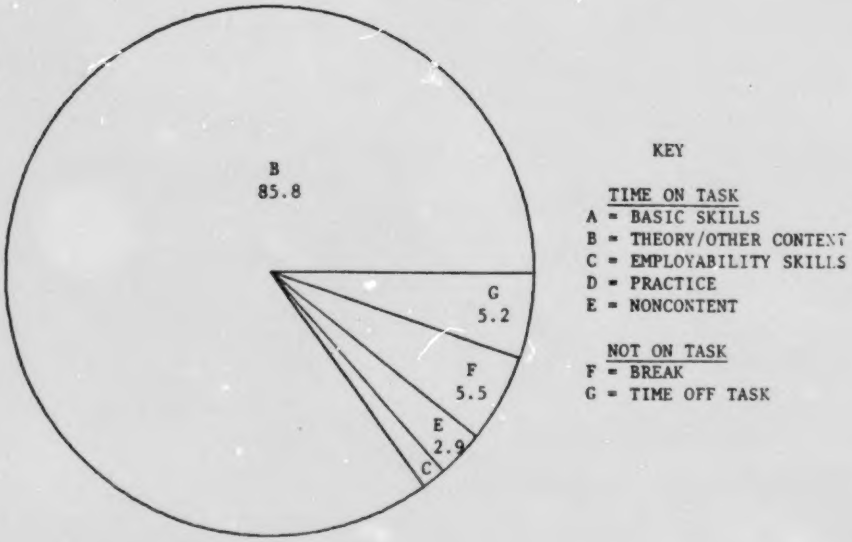

FIGURE 9. PERCENTAGES OF TIME USED IN POSTSECONDARY AGRICULTURE CLASS.

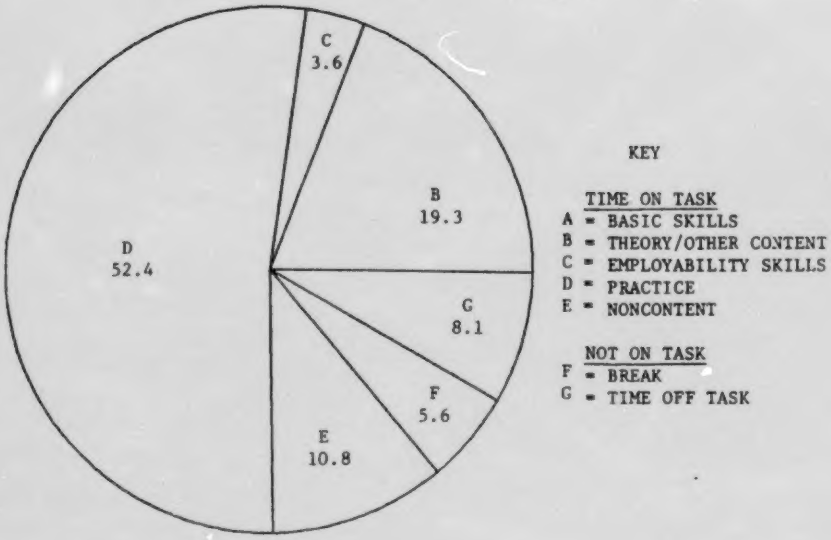

FIGURE 10. PERCENTAGES OF TIME USED IN POSTSECONDARY BUSINESS AND OFFICE CLASSES.

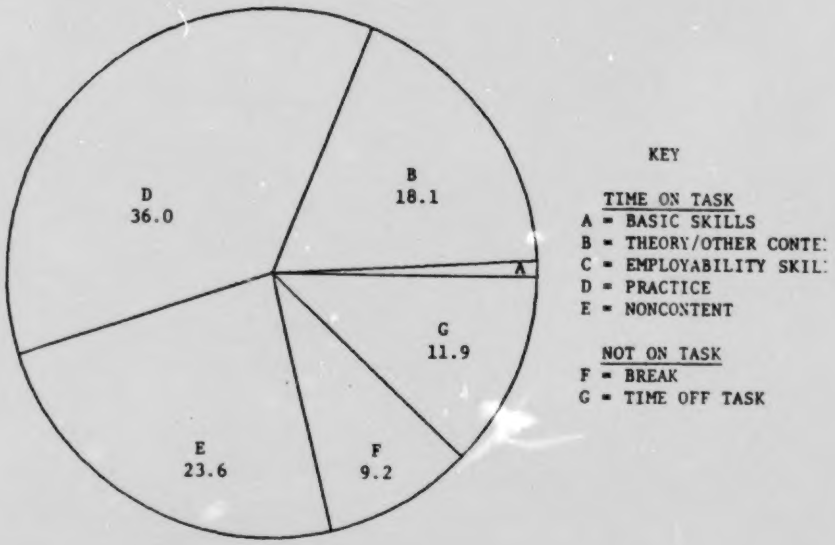

FIGURE 11. PERCENTAGES OF TIME USED IN POSTSECONDARY TRADE AND INDUSTRIAL CLASS.

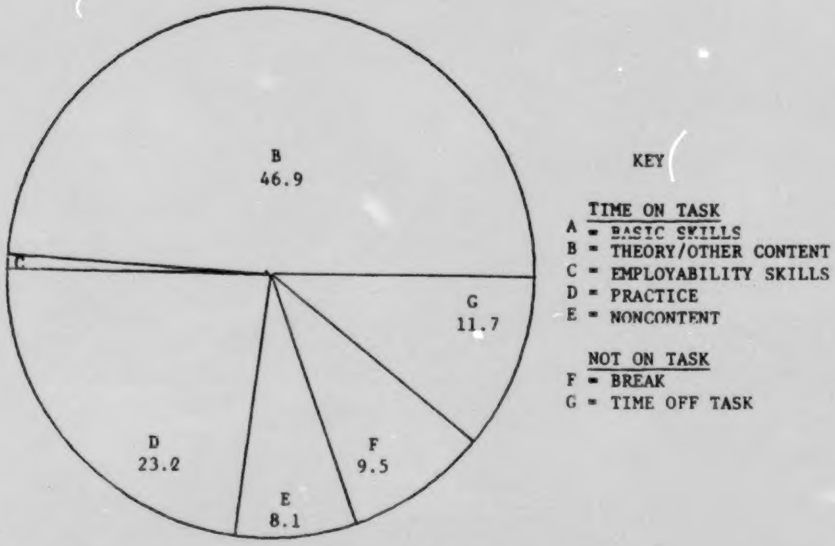

FIGURE 12. PERCENTAGES OF TIME USED IN POSTSECONDARY TECHNICAL CLASSES.

(.25 percent), employability skills (1.61 percent), theory (42.3 percent), practice (27.9 percent), and noncontent (11.4 percent). The students also spent 7.5 percent of the time on scheduled breaks and 9.2 percent of the time off task. The proportions of time use varied greatly among the four service areas, as shown in figures 90 through 12. Note, however, that the pie charts for agriculture and trade and industrial each represent only one class.

Total time on task did not vary much among the service areas or the classes as indicated in table 25. The highest time on task was found in the AC laboratory (10725, 96.13 percent), whereas the lowest was in the AC fundamentals class (10716, 76.40). Both classes were taught by the same teacher, and the major difference seemed to be that students came to the lab to conduct experiments or take competency-based quizzes and left when they completed their objectives. The other class was held late Friday afternoons. It was lecture/discussion oriented and the teacher worked hard to retain the students attention even though he appeared to have an excellent relationship with them and explained the lessons very well.

Another relatively low time-on-task class was the machine shop (20905) where the teacher switched to the competency-based curriculum during the week of observations which appeared to upset many students. As a result, a number of students seemed to take excessive time to set up and clean up (23.62 percent), which although considered on-task, did not appear to contribute to building their technical skills as machinists. The noncontent time in other classes was lower, ranging between 1.57 percent in an AC fundamentals class (10720) to 18.00 percent in the shorthand/typing class (20823).

Although there was no time spent on practice in the agriculture class, 52.4 percent of the time was spent on practice in business and office classes, 46.9 percent in technical classes, and 36.0 percent in the trade and industrial class. Conversely, 85.8 percent of the time was spent on theory in the agriculture class compared to the 18.1 percent spent in trade and industrial classes, 19.3 percent in the business and office classes, and 46.9 percent in the technical classes.

Very little time was spent on basic skills (.25 percent) and employability skills (1.61 percent). Basic skills were primarily used (1.09 percent) in the competency-based workbooks and skill sheets in the machine shop (20805). Most of the references to employability skills were made by the part-time business and office teachers who integrated a great deal of "world-of-work" information into their explanations.

Time on break ranged between 0.00 percent for several business and office classes and the electricity lab (10725) to 17.13 percent for a word processing class (10710). Although in some

TABLE 25

PROPORTIONS OF TIME SPENT BY POSTSECONDARY STUDENTS DURING 5,915 MINUTES OF OBSERVATION

Class/ Class Code	Time On Task					Total Time On Task	Time On Break	Time Off Task
	Basic Skills	Employability Skills	Theory	Practice	Noncontent			
Agriculture								
Pests and Diseases 10706	0.00	1.48	85.85	0.00	2.94	90.27	5.53	5.22
Business and Office								
Type II 10708	0.00	9.89	16.63	46.73	7.76	81.01	12.13	6.88
Word Proc 10710	0.00	0.00	35.01	37.08	7.88	79.97	17.13	2.91
Beg Typing 10711	0.00	0.00	35.12	46.58	4.42	86.12	11.69	2.13
Adv Type 10712	0.00	5.75	23.37	47.58	8.93	85.63	5.48	8.88
Ct Report 10713	0.00	10.52	14.28	41.78	11.08	77.66	12.08	10.21
Word Proc 20810	0.00	.04	10.35	72.13	13.22	95.74	0.00	4.27
Acctg 20817	0.00	.13	11.40	68.77	10.41	90.71	0.00	9.28
Data Proc 20818	0.00	.21	18.68	57.89	11.12	87.90	0.00	12.19
Short/Type 20823	.08	.74	27.93	42.22	18.00	88.97	0.00	10.93
Average	.01	3.60	19.33	52.40	10.86	86.20	5.65	8.15

TABLE 25
(continued)

Class/ Class Code	Time On Task: Basic Skills	Time On Task: Employability Skills	Time On Task: Theory	Time On Task: Practice	Time On Task: Noncontent	Total Time On Task	Time On Break	Time Off Task
				Trade and Industrial				
Mach Shop 20805	1.09	0.00	18.10	36.09	23.62	78.90	9.16	11.94
				Technical				
Ref and AC 10716	.13	0.0	24.36	41.03	11.49	77.01	2.44	20.56
AC Fund 10720	.33	.33	73.88	.70	1.57	76.81	16.37	6.80
AC Fund 10724	0.00	1.22	70.06	0.00	5.12	76.40	9.73	13.85
Elec Lab 10725	0.00	.18	56.07	30.36	9.52	96.13	0.00	3.86
Electricity 20819	0.00	.02	34.05	33.18	10.33	77.58	11.63	10.63
Average	.08	.29	46.99	23.24	8.11	78.71	9.50	11.72
Average all classes	.25	1.61	42.3	27.9	11.40	83.50	7.50	9.20

classes that had scheduled breaks there was less time off task, in most classes the break time simply added to off-task time. In most postsecondary classes, scheduled whole-class breaks appeared unnecessary since all the teachers had an "open door" policy that allowed for using restrooms, getting coffee, and so forth. Break times appeared to be more desired by the teachers than the students, many of whom continued practice regardless of the officially announced breaks.

Question Three (Postsecondary)

> What are the relationships of time spent by teachers on various instructional and managerial behaviors to student time on task?

The postsecondary teachers used various styles of teaching. The part-time teachers included more references to the "real world of work" than did the full-time teachers. They also appeared to assign more work that was based on tasks currently considered important in their job as opposed to the full-time teachers. Although there was not a wide range of time on task among the postsecondary classes, the teacher instructional/managerial behaviors appeared to account for some of the differences that did exist.

Teacher With-it-ness. Overall, the teachers appeared to be tuned in to most of their students' needs the majority (52 percent) of the time as shown in table 26. There were no strong patterns or trends indicating relationship between the level of with-it-ness and the proportion of time on task. It would be tempting to assume that the reason there was a fairly consistent high level of time on task was because the teachers were rarely "tuned out." That was probably not the case--with some exceptions. One exception occurred in the accounting class (20817), which started at 8:00 a.m. Several of the students tended to doze while working on the individually paced, competency-based worksheets. The teacher made a point to frequently walk to the area of the room where the students sat, which always awakened them, and prompted them to resume their tasks. Several of the other teachers also had subtle ways to keep the postsecondary students on task when necessary without reprimanding or embarrassing them. For the most part, however, the students did not require reminders to stay on task. In fact, often a greater proportion of students were on relevant tasks when the teacher was out of the room. Some teachers actually seemed to deter students from their tasks by chatting with them or someone near them or by interrupting frequently to give directions and provide explanations. For example, the electronics (20819) teacher

TABLE 26

TEACHER WITH-IT-NESS IN POSTSECONDARY CLASSES

Class/ Class Code	Percent of Time on With-it-ness[1] From Highest Means to Lowest 1	2	3	4	5	n/a
Agriculture						
Pests and Diseases 10706	11.0	58.5	22.3	1.8	0.9	6.4
Business and Office						
Typing II 10708	33.1	24.2	5.8	2.1	9.2	25.6
Word Processing 10710	49.7	5.0	10.5	15.5	0.0	19.3
Begin Typing 10711	63.0	4.5	0.0	0.0	18.8	13.6
Advanced Typing 10712	74.3	15.8	0.3	0.0	0.0	9.6
Court Reporting 10713	68.2	4.1	1.9	6.6	0.0	19.1
Word Processing 20810	82.2	1.4	0.6	0.6	5.0	10.3
Accounting 20817	56.2	35.6	3.2	1.2	0.7	3.0
Data Entry 20818	51.5	9.0	7.8	0.3	2.6	28.8
Shorthand/Typing 20823	36.8	38.6	14.9	6.3	0.0	3.4
Average	55.8	17.6	5.2	3.2	3.5	14.7
Trade and Industrial						
Machine Shop 20805	77.6	7.5	0.1	4.2	0.4	10.6
Technical						
Refrig and Air Cond 10716	42.6	23.0	24.6	0.6	0.0	9.2
A.C. Fundamentals 10720	57.1	7.3	6.6	0.3	1.3	27.3
A.C. Fundamentals 10724	64.8	12.4	3.3	0.0	0.0	19.6
Laboratory A.C. 10725	89.4	4.6	0.0	0.0	0.0	5.9
Electronics 20819	14.4	37.7	12.0	9.0	6.6	20.3
Average	41.4	22.9	10.8	3.8	2.9	18.1
Average for all Classes	52.0	20.1	7.2	2.8	3.2	14.7

[2] With-it-ness is defined as:
1 = Sensitive to all/sensitive to students at many levels
2 = Sensitive to most students' needs
3 = So-so/variable sensitivity to student needs
4 = Not sensitive to most needs
5 = Not sensitive to anyone's needs
n/a= Other/does not apply

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tended to talk about fishing, baseball, or anything but electronics with small groups of students who were on task most of the time when he was in another part of the room or out of the room altogether.

Teacher role. The teacher role variable incorporated the type of teacher interaction with students and the amount of teacher observation of students. As shown in table 27, the average for all classes indicated that teachers were observing and interacting with all students or with groups/individuals almost two-thirds (63.6 percent) of the time. There was no apparent pattern for high or low time on task classes, most likely due to the diverse types of classes in the sample. Although there was variance in the teacher roles among the service areas and individual classes, most of the variance appeared to be consistent with the nature of the student use of time. For example, in the air conditioning laboratory (10725), the teacher was 74.8 percent on Role 2, observing and interacting with group/individual. That role was the best one for relating to students working individually at lab stations. In the court reporting class, on the other hand, the teacher was 60.2 percent in Role 1, which was also appropriate for his simulation of the depositions or types of information that would be recorded in courtrooms.

It appeared that most of the teachers observed and interacted with students at an appropriate level. They were, with a few exceptions, available to answer questions or give directions when students needed them. It was clear that sometimes the students did not need them at all and actually accomplished more when the teachers were occupied with their own work or out of the room.

Teacher method. Postsecondary teachers spent a fourth (25.1 percent) of the time providing one-to-one instruction as displayed in table 28. A close second (23.8 percent) was spent giving directions, explaining, or demonstrating. Teachers spent the third greatest amount of time (17.3 percent) on other or miscellaneous methods and being out of the room. The proportion of time that teachers used the following methods was: doing own work or paperwork (9.1 percent), discussing or question and answer (7.25 percent), observing (5.48 percent), lecturing/audiovisuals (3.16 percent), testing/inspecting work (2.79 percent), announcements/passing out materials (2.56 percent), cleaning up/setting up (1.28 percent), and socializing with students (.95 percent).

The teachers' methods varied with the service area, although there were exceptions among classes within the same service areas. Although one-to-one instruction predominated in business and office classes (28.81 percent) and the trade and industrial class (35.54 percent), giving directions, explaining, or demonstrating predominated in the technical classes (24.61 percent).

TABLE 27

TEACHER ROLE IN POSTSECONDARY CLASSES

Class/ Class Code	Percent of Time on Role[1] 1	2	3	4	5	n/a
Agriculture						
Pests and Diseases 10706	72.0	.6	20.4	1.2	.6	5.2
Business and Office						
Typing II 10708	27.5	9.4	14.2	25.8	17.7	5.4
Word Processing 10710	0.0	56.9	13.8	12.2	0.0	17.1
Begin Typing 10711	42.2	2.6	13.6	39.0	2.[illegible]	0.0
Advanced Typing 10712	35.3	34.6	12.3	11.6	0.7	5.5
Court Reporting 10713	60.2	11.0	0.3	3.3	13.8	11.3
Word Processing 20810	12.8	55.2	10.6	19.2	2.2	0.0
Accounting 20817	0.7	63.2	10.4	21.4	3.0	1.2
Data Entry 20818	2.9	60.8	2.0	3.8	30.5	0.0
Shorthand/Typing 20823	18.3	49.9	13.6	16.2	2.1	0.0
Average	21.9	38.7	9.8	16.3	9.3	4.1
Trade and Industrial						
Machine Shop 20805	1.0	66.0	13.3	10.6	0.0	9.2
Technical						
Refrig and Air Cond 10716	20.5	65.0	5.7	1.3	7.6	0.0
AC Fundamentals 10720	59.5	3.0	5.6	9.3	12.6	10.0
AC Fundamentals 10724	64.8	10.4	1.3	9.8	4.2	9.4
Laboratory A.C. 10725	0.0	74.8	5.3	17.2	2.6	0.0
Electronics 20819	1.7	49.2	8.8	22.0	18.4	0.0
Average	25.3	39.8	6.2	13.7	11.8	3.3
Average for all classes	22.8	40.8	9.8	13.9	8.3	4.6

[1] Role is defined as:
1 = Observing all/interacting with all students in class
2 = Observing and interacting with group/individual
3 = Observing activity but not interacting (monitoring)
4 = In room/office but not observing or interacting
5 = Not in room at all
n/a = Other/does not apply

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TABLE 28

METHODS USED BY POSTSECONDARY TEACHERS

Class/ Code	One-to One	Discuss Q-&-A	Social-izing	Lecture Audio/ Visual	Announce-ments	Direct/ Demo	Test/ Inspect	Observe	Own Work	Clean-up/ Set-up	Other
Agriculture											
Pests and Diseases (10706)	0.30	23.78	0.00	6.71	9.14	32.93	19.51	0.00	0.00	1.83	5.79
Business and Office											
Type II (10708)	6.46	6.46	2.29	10.42	3.96	9.17	0.00	7.71	14.58	1.67	37.29
Word Proc (10710)	11.60	0.00	0.00	0.00	0.00	45.30	0.00	0.00	0.00	0.00	43.09
Beg Type (10711)	4.55	1.95	0.00	29.22	.65	7.79	0.00	1.95	14.94	0.00	38.96
Adv Type (10712)	28.42	2.40	4.11	2.74	4.11	26.37	7.19	8.90	9.25	0.34	6.16
Ct Report (10713)	9.12	6.35	0.83	0.00	1.38	49.72	4.14	0.28	0.28	0.55	27.35
Wd Proc (20810)	54.87	0.28	0.00	0.00	0.28	13.09	0.00	9.19	13.09	0.00	9.19
Acctg (20817)	53.48	6.97	0.50	0.00	1.00	2.98	0.00	5.22	22.64	0.00	5.97
Data Proc (20810)	38.66	0.00	0.00	0.00	1.45	23.54	0.00	2.03	1.74	0.00	32.56
Short/Typ (20823)	34.46	3.66	0.26	0.78	7.57	21.67	1.04	10.44	16.97	0.52	2.61
Average	28.81	3.62	.98	3.39	2.57	20.90	1.35	5.68	11.16	.44	20.73
Trade and Industrial											
Machine Shop (20805)	35.54	1.81	0.00	0.00	0.00	29.03	0.00	10.12	6.99	0.12	13.98
Technical											
Ref and AC 10716	38.49	33.12	3.15	4.73	0.00	2.84	0.00	3.79	5.05	0.95	6.31
AC Fund 10720	1.99	8.30	0.00	9.30	3.32	38.87	8.31	0.00	6.98	0.00	22.92
AC Fund 10724	9.77	10.42	0.33	5.21	8.47	41.70	8.14	0.00	1.30	0.33	13.03
Elec Lab 10725	42.38	4.63	0.00	0.00	0.00	27.15	0.00	4.64	3.97	1.32	15.89
Elect 20819	16.02	8.15	2.21	0.00	1.25	20.44	1.52	7.32	14.23	6.91	16.85
Average	18.78	12.67	1.50	3.28	2.50	24.61	3.39	4.00	8.33	3.11	15.28
Average for all classes	25.12	7.23	.95	3.16	2.56	23.84	2.79	5.48	9.10	1.28	17.30

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Within the technical service area, there were acute differences due to the nature of the class. In one air conditioning fundamentals class (10720), the teacher primarily explained and demonstrated (38.87 percent) electrical currents while the same teacher mostly provided one-to-one instruction (42.38 percent) in the laboratory class (10724).

The relationships among teacher methods and student time uses were investigated through one-way analysis of variance. The data in table 29 show which methods were used most frequently with each type of student time use. One-to-one instruction, cleaning, cleaning up/setting up, and working on one's own had the highest means for student time on task while the lecture/audiovisual had the lowest. Although surprising, the negative relationship of lecture/audiovisuals to student time on task can perhaps be explained when considering that method was only used 3.16 percent of the time and the results of the one-way analysis were based on frequency.

The methods with the highest means for student time on practice were one-to-one instruction, working on own, and observing. In contrast, the methods with lowest means were lecture/audiovisuals, testing/inspecting, and making announcements/passing out materials. For time on theory, the highest means were for testing/inspecting, discussing/question and answer, and cleaning up/setting up. Socializing, other methods, or lecture/audiovisuals had the lowest means.

Time on noncontent was most related to socializing and cleaning up/setting up and least related to lecture/audiovisuals. Socializing also had the highest mean for time off task, whereas testing/inspecting work in progress had the lowest. Apparently, student time off task was least liable to occur when the teacher was assessing student work, whether through written tests and quizzes, or inspections of work in progress.

Although cause and effect cannot be inferred, the one-way analysis indicates that some methods are more likely to be used than other to elicit student on-task behavior. The relationships shown in table 29 were similar in the analyses of the service areas. One exception was that for trade and industry, the highest means for time on theory were observing. Another exception was in business and office, where the highest mean for time on noncontent was announcing/passing out materials.

Additional Teacher Behavior Variables

Aside from the teacher role, with-it-ness, and methods recorded on a minute-by-minute basis, additional teacher behaviors were noted in narrative fashion. These notes indicated that there are individual teacher differences that appeared to be

TABLE 29

TEACHER METHODS RELATED TO POSTSECONDARY STUDENT TIME USE

Student Time	Percent of Student Time	F Ratio Probability	Teacher Methods with Highest Means		Teacher Methods with Lowest Means	
Time on Practice	27.9	166.66/	One-to-One	58.88	Lecture/Audiovisuals	1.84
		0.00	Work on Own	49.94	Test/Inspect	10.15
			Observe	41.69	Announce/Pass Out Materials	11.99
Time on Theory (includes Basic Skills and Employability Skills)	42.3	41.95/	Test/Inspect	40.18	Socializing	10.98
		0.00	Discuss/Q & A	38.65	Lecture/Audiovisuals	13.71
			Clean Up/Set Up	33.63	Other	12.29
Time on Noncontent	11.4	28.06/	Socialize	17.55	Lecture/Audiovisuals	.82
		0.00	Clean up/set up	14.05		
Total time on task	85.5	86.97/	One-to-One	94.43	Lecture/Audiovisuals	16.15
		0.00	Clean Up/Set Up	84.33		
			Work on Own	79.48		
Total time off task	9.2	25.32/	Socializing	25.40	Test/Inspect	.80
		0.00				

associated with use of time. Although there were no classes with truly low proportions of time on task, there appeared to be teacher behaviors related to proportions of time spent on practice and theory. As in the secondary classes, defining class goals was the most important variable related to student time on task. The teachers of classes with the highest time on content-related tasks started the class promptly and immediately explained the goals to be accomplished. Postsecondary teachers frequently explained how the short range goals fit into the long range goals and why they were important in terms of the world of work. For example, a business and office teacher said,

> Today we will type invoices as part of the accounting module you are doing. Invoices are very important in business--they're bills sent to customers and must be exact. I want you all to strive for exactness . . . watch those decimal points!

Unlike the secondary students, most of the postsecondary students appeared to have a general understanding of what to do. It was apparent that tasks written on the board, handed out in agendas, or posted on bulletin boards decreased the need to wait for instructors.

Most of the postsecondary teachers had well-planned and well-organized curricula. Rarely did they search for materials, and most of the equipment was new or in excellent condition. Most postsecondary students were responsible for bringing their own supplies to classes, but teachers had extra supplies for those who forgot. There appeared to be very little vandalism or stealing of supplies, and most teachers did not have to spend a lot of time safeguarding equipment or materials. Although there were subtle differences among the teachers, for the most part the observers felt that student opportunities to be on task were not lessened due to teacher disorganization or poor planning.

Many of the postsecondary teachers seemed to maximize class time deliberately. They appeared to value the scheduled class time, perhaps because students were paying for the education. The students also appeared to want to maximize the allotted time or to complete assignments quickly in order to leave early. Many students held part-time or full-time jobs, so they used their time well while in school.

Many postsecondary teachers conveyed an attitude of urgency, that "time is money," and that work in the real world had to be done efficiently. They closed doors and started classes more promptly at the community college than at the adult technical school, but both institutions seemed to regard time as a valuable resource that was not to be wasted. Especially in the business and office classes, the teachers maintained a continual flow of meaningful activities that related to real world of work tasks.

Some teachers were better than others in maximizing time. For example, one typing teacher whose class (10708) had 7.7 percent time on noncontent and 46.7 percent time on practice had a rule that when a whole-class assignment was finished, students would work on long-term projects until the next whole-class assignment was started. Another typing teacher, whose class (20823) had 42.2 percent time on practice and the highest time on noncontent of all classes (18.0 percent), had a rule that when the whole-class assignment was finished, students would set up for the next assignment and fold their hands and quietly wait for everyone to be finished. Although the quality of the "extra" work done by the students in class 10708 could not be judged, it appeared that those students had more opportunities to practice typing skills that depend, to a large degree, upon repetition. Even though both classes were second-year courses, the observers noticed that the expected typing rates were higher (e.g., 65 words per minute to get an A compared to fifty-five words per minute) in the class with more opportunities to practice skills.

Many of the postsecondary teachers appeared to be good models of the work ethic. Not only were they motivated and thorough, "no-nonsense" teachers in class, several teachers held full-time jobs in the real world of work. These part-time teachers seemed especially effective in relating class assignments to jobs. The court reporting teacher continuously cited examples of how the skills being taught would be useful in real work situations. The students were obviously interested and seemed especially eager to increase their precision and skill in recording.

Even when teachers did not hold other jobs, they dressed and behaved as professionals in their field. With one exception, the business and office teachers dressed in suits or other clothing appropriate for offices. In the machine shop and the technical classes the teachers wore laboratory or shop coats with their names stitched on the pockets. When teachers were not supervising students they typically did paperwork at their desks and appeared busy and involved.

Since all of the teachers appeared to have the necessary content, knowledge, and skill proficiency for their positions, it was difficult to ascertain whether this quality made any difference in the postsecondary students' time on task. One teacher, however, appeared to help keep his students interested and on task with his expertise not only in the principles of electricity but also his skill in presentation. The AC fundamentals teacher held students' attention with his skillful diagrams and explanation of electrical currents for almost two hours without a break on a Friday afternoon. Although this class had a relatively low overall time on task, it was apparent that a less-skilled teacher would not have maintained these students' attention because most were tired after a week of full-time work and part-time school.

The effort of positive reinforcement was subtle but apparent to the observers. Teachers who had exhibited the ability to praise students and encourage them positively seemed to encourage them to work harder. The observers noted that at Site 1, two typing teachers were very different in their approach to motivating students. Whereas one teacher was cold, stern, and critical, the other was friendly and made many positive comments to deserving students. The time on practice and theory was higher in the latter teacher's class, and the students' morale seemed to be higher as well.

Question Four (Postsecondary)

> What are the relationships of classroom variables to student time on task?

The grouping variable, interruptions, disruptions, and absence were the classroom variables investigated relative to student time on task.

Grouping. As shown in table 30, postsecondary students spent 88 percent of the time in Groups 2 and 4, which meant they were predominantly in one classroom. Unlike the secondary classes that were frequently in more than one room, the postsecondary classes were less spread out. Students were mostly in Group 4 (58 percent)--in one room and working on the same task. In fact, the agriculture class (10706) was always in Group 4 since the teacher was oriented toward theoretical explanations, with drawings on the chalkboard and discussions afterward. The trade and industrial class (20805) was also always in one large shop but working on various different tasks (Group 2). Only one class, beginning typing (10711), spent time in Group 3 when the teacher had several students go to the adjoining classroom to use different typewriters to do the class assignment.

Except for one class, the grouping did not appear to have much influence on postsecondary students. The exception was the refrigeration and air conditioning class (10716) where the teacher had two classes at the same time in three adjoining rooms. Two rooms were crammed with desks while the third room was long, very cluttered with refrigerators, air conditioning piping, and other large equipment. It was impossible to view all of the students at the same time. The teacher moved about frequently to provide one-to-one or small group instruction, but he did not see many of the students most of the time. Although the majority of the students were displaced adult workers who appeared intent upon learning new skills, a few of the recent high school graduates took advantage of the isolated work spaces among the equipment to smoke, chat, and stay off task.

TABLE 30

DISTRIBUTION BY GROUPING[1] OF POSTSECONDARY CLASSES

	Group 1		Group 2		Group 3		Group 4	
Service Area	Number Minutes	Percent of Total	Number Minutes	Percent of Total	Number Minutes	Percent of Total	Number Minutes	Percent of Total
Business and Office Education	691	30%	103	4%	161	7%	1953	85%
Agricultural Education	none		none		none		299	100%
Trade and Industrial Education	none		681	100%	none		none	
Technical Education	284	20%	608	44%	none		470	34%
All service areas	353	7%	1392	30%	161	3%	2722	58%

[1] The grouping variable is a combination of student dispersement and grouping. The four combinations derived statistically were:

Group 1 = Students are in two or more adjoining rooms and are working individually or in small groups and various content.

Group 2 = Students are in one room and are working individually or in small groups on various content.

Group 3 = Students are in two or more adjoining rooms but are working as a class on one content area.

Group 4 = Students are in one room and are working as a class on one content area.

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There was, however, a relatively high level of time on task (77.0 percent) in part due to the older students' motivation but also because the teacher told the students what the goals were for the day, had the necessary materials on hand, and had the students use competency-based skill practice modules. Students used these modules, which looked like large boxes with many switches, hoses, and wires, to conduct simulated experiments and tests in wiring equipment or fixing a broken furnace.

In comparison to the other service areas that employed hands-on activities, the business and office classes had more time on practice (52.4 percent) and also the highest time on task (86.3 percent). The business and office classes were frequently (37 percent) in more than one room, that did not appear to lessen student time on task. As in the air conditioning class, it appeared that the majority of the students were self-motivated and did not require close supervision. Furthermore, the teachers were well organized, were clear about the daily and long-term goals, and assigned the students a large volume of work that could only be completed if students worked continuously.

There were very few incidents noted as disruptions (.8 percent) and interruptions (2.8 percent) in the sixteen postsecondary classes. As shown in table 31, there were no disruptions or interruptions in the agriculture class (10706). All the other classes had a few minutes of interruptions, such as students from other classes coming in, public address announcements, telephones ringing, and so forth. Neither the interruptions or the disruptions seemed to effect the students' time on task except those directly involved. For example, if two students started joking with each other loudly (disruption), then typically only those students were off task. The postsecondary students were not easily distracted when they had to meet goals at a specified time.

Many of the teachers seemed to be aware of ways to minimize interruptions and disruptions. These teachers talked quietly to students in one-to-one situations and did not give directions loudly to students across the room. They closed doors to the hallways and adjoining classrooms being used by other teachers. The court reporting teacher (10713) unplugged the telephone in the classroom to avoid interruptions. In the AC fundamentals classes there was an intermittant loud noise coming from the adjoining laboratory classroom about which the teacher commented but overcame by explaining the diagrams in a louder voice. Students sometimes leaned forward in their seats to hear him better and, rather than taking the opportunity to tune out, were even more attentive since the explanations were interesting and important to understand.

TABLE 31

DISRUPTIONS AND INTERRUPTIONS IN POSTSECONDARY CLASSES

Class/ Class Code	Percent of Time on Disruptions (from within class)	Percent of Time on Interruptions (from outside class)
Agriculture		
Pests and Diseases 10706	0.0	0.0
Business and Office		
Typing II 10708	0.0	2.3
Word Processing 10710	0.0	.6
Beginning Typing 10711	0.0	3.2
Advanced Typing 10712	1.4	1.4
Court Reporting 10713	0.0	.8
Word Processing 20810	6.1	1.7
Accounting 20817	0.0	4.5
Data Entry 20818	3.2	9.6
Shorthand/Typing 20823	0.0	2.3
Average	1.3	3.0
Trade and Industrial		
Machine Shop 20805	.6	2.9
TECHNICAL		
Refrig. and Air Conditioning 10716	0.0	.3
AC Fundamentals 10720	1.3	.7
AC Fundamentals 10724	0.0	1.0
Laboratory AC 10725	0.0	4.6
Electronics 20819	0.0	2.8
Average	0.2	1.8
Average for all classes	0.8	2.5

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Absence. Overall, postsecondary students were absent 19 percent of the time when absenteeism is calculated by dividing the number of student minutes present by the number of student minutes enrolled. In reality, this method of calculating the percentage of absence did not reflect true absence. As a result of the somewhat flexible attendance policies at both schools, it was impossible to determine if students were late or left early or should be noted as absent. Nonetheless, the rates of absence varied somewhat by service areas as, shown in table 32. The rates were: agriculture, 20 percent; business and office, 23 percent; trade and industrial, 4 percent; and technical, 28 percent. There was a wide range of absence among sites. The mean absence rate at Site 1 was 28.4 percent compared to the mean rate of 11.2 percent at Site 2. There was a blizzard at Site 1 during the observations. Also, in most classes at Site 1, community college students did not have to arrive in the class at the officially scheduled time. They worked to accomplish their goals for the day and left when they were finished. Teachers did not take roll in most classes at that school because they believed that learning was an individual responsibility. Students were not reprimanded for being late, leaving early, or not coming to class at all. The AC laboratory teacher said that students who did not go to the lab class invariably failed the course, not because they were absent but because they could not comprehend the concepts. In the business and office classes assignments had to be completed with typewriters, word processors, and adding machines, which motivated students to be in class or come at another time.

At the adult technical institution school (Site 2) there was less flexibility in attendance requirements. Teachers took roll and expected students to be present. The business and office classes were in several adjoining rooms, however, and teachers did not object when students stayed in their previous class to finish assignments or left early to go to their next class. During the first five minutes of class time students went back and forth among several classrooms to chat briefly with teachers or other students, collect their books, borrow reference books, and so forth.

As indicated in table 32, there was a wide range of absence (8.1 to 58.7 percent) within the business and office service area at Site 1. There did not appear to be any discernible relationship between student time on task and absences in those classes. Likewise, there were no apparent links between time on task or rate of absence in the other classes. It should be pointed out that there was no enrollment per se recorded for the AC laboratory because it was a scheduled teacher-supervised time for any of the electricity students to conduct experiments and take competency tests. As a result, the absence rate was 0.0 percent which may have skewed the service area and all classes' average somewhat.

TABLE 32

PERCENT OF STUDENTS ABSENT IN POSTSECONDARY CLASSES

Class/ Class Code	Percent Time on Task	Percent Absent
Agriculture		
Pests and Diseases 10706	90.27	19.3
Business and Office		
Typing II 10708	81.01	17.5
Word Processing 10710	79.97	7.1
Beginning Typing 10711	86.12	58.7
Advanced Typing 10712	85.63	8.1
Court Reporting 10713	77.66	50.5
Word Processing 20810	95.74	8.5
Accounting 20817	90.71	16.7
Data Entry 20818	87.90	9.6
Short/Typing 20823	88.97	12.1
Average	86.20	22.3
Trade and Industrial		
Machine Shop 20805	78.90	3.5
Technical		
Refrigeration and Air Conditioning 10716	77.01	24.6
AC Fundamentals 10720	76.81	11.8
AC Fundamentals 10724	76.40	38.3
Laboratory AC 10725	96.13	0.0
Electronics 20819	77.98	21.4
Average	78.71	23.0
Average for all classes	83.50	19.0

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Question Five (Postsecondary)

> What is the relationship among student use of time, teacher instructional/managerial behaviors, and classroom variables?

Profiles were constructed to indicate relationships among the key variables in the study. Teacher methods were juxtaposed with student time use, dominant teacher role, dominant teacher with-it-ness and dominant student grouping in tables 33 through 37. (The predominant student time use is underlined for each method.)

As indicated in the profile of all postsecondary classes (table 33), the most frequently used teacher method was one-to-one instruction. It occurred most often when students were practicing (54.4 percent), the teacher role was to observe and interact with a group or individual, the teacher with-it-ness level was to be sensitive to all student needs, and the students were located in one room working on the same assignment.

This pattern did not hold in all service areas, however. There was only one minute of one-to-one instruction recorded in the agriculture class, and that method was not the most frequently used in the technical classes either. In the business and office classes, the pattern was the same as for the average of all classes, whereas in the trade and industrial class the teacher with-it-ness level was to have variable sensitivity with the students in one room but working on different tasks.

The second most frequently used method for all classes was explaining, giving directions, or demonstrating. This method occurred most often when they were learning theory (51.1 percent). The dominant teacher role was to observe and interact with a group or individual, the teacher with-it-ness level was to be sensitive to all needs, and the students were located in one room, working on the same task. The third most frequently used method was the miscellaneous, break, or out of the room category. This method was used mostly when students were practicing, teachers were out of the room or not observing students, teachers were not all sensitive to student needs, and students were in one room.

The patterns of teacher behaviors and student groupings were fairly consistent across the service areas. As described earlier, the postsecondary classes all had a high rate of time on task so the similarities across the classes were not surprising. Perhaps one of the most important conclusions that was derived from the analysis was that postsecondary students appear to stay on task regardless of teacher or grouping factors.

TABLE 33

PROFILE OF ALL POSTSECONDARY CLASSES: TEACHER METHOD, ROLE, WITH-IT-NESS BY STUDENT TIME AND GROUPING

Teacher Method	Total Minutes on Method	Percent of Student Time[1]				Dominant Teacher Role[2]	Dominant Teacher With-it-ness[3]	Dominant Student Group[4]
		Theory	Practice	Non-Content	Off Task			
1. One-to-one instruction	1486	20.6	54.4	13.5	10.8	2	1	4
2. Discussion/questions and answers	428	63.7	18.3	7.0	10.5	1	1	4
3. Socialize	56	14.1	18.8	18.6	48.5	2	3	4
4. Lecture/audio visual	187	95.5	2.3	.8	1.5	1	1	4
5. Announce/pass materials	151	43.5	15.1	24.7	16.1	1	2,1	4
6. Clean up/set up	76	31.8	33.3	14.8	21.0	4	2	2
7. Explain directions/demonstrate	1410	51.1	33.0	9.5	6.2	1,2	1	4
8. Test/inspect work	165	79.4	14.4	5.5	.8	3	3	4
9. Observe	324	15.8	51.1	22.7	10.4	3	1	4
10. Work on own/paperwork	538	17.52	58.41	11.74	12.19	4	3	4
11. Other/break/out of room	1023	12.0	34.1	9.8	8.8	5,4	5	4,2
Total minutes observed 5915								

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[1] Rows do not add to 100 percent because time on break is not included in this analysis

[2] Role:
1=Observing all/interacting with all students
2=Observing/interacting with group/individual
3=Observing activity but not interacting
4=In room/office but not observing/interacting
5=Not in room at all

[3] With-it-ness:
1=Sensitive to all/sensitive at many levels
2=Sensitive to most needs
3=So-so/variable sensitivity to needs
4=Not sensitive to most students
5=Not sensitive at all

[4] Group:
1=Students in more than one room working on various tasks
2=Students in one room working on various tasks
3=Students in more than one room working on same task
4=Students in one room working on same task

TABLE 34

PROFILE OF ALL POSTSECONDARY AGRICULTURE CLASSES: TEACHER METHOD, ROLE, WITH-IT-NESS BY STUDENT TIME AND GROUPING

Teacher Method	Total Minutes on Method	Percent of Student Time[1]				Dominant Teacher Role[2]	Dominant Teacher With-it-ness[3]	Dominant Student Group[4]
		Theory	Practice	Non-Content	Off Task			
1. One-to-one instruction	1	100.0	0.0	0.0	0.0	2	4	4
2. Discussion/questions and answers	78	94.8	0.0	.1	4.8	1	1	4
3. Socialize	0	0.0	0.0	0.0	0.0	n/a	n/a	n/a
4. Lecture/audio visual	22	99.6	0.0	.1	.3	1	2	4
5. Announce/pass materials	30	82.3	0.0	13.6	4.1	1	2	4
6. Clean up/set up	6	27.9	0.0	.5	83.3	3	2	n/a
7. Explain directions/demonstrate	108	97.2	0.0	.2	4.2	1	2,1	4
8. Test/inspect work	64	91.8	0.0	8.1	.1	3	3	4
9. Observe	0	0.0	0.0	0.0	0.0	n/a	n/a	n/a
10. Work on own/paperwork	0	0.0	0.0	0.0	0.0	n/a	n/a	n/a
11. Other/break/out of room	2	0.0	0.0	0.0	100.0	4	4	4

Total minutes observed 311

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[1] Rows do not add to 100 percent because time on break is not included in this analysis

[2] Role:
1=Observing all/interacting with all students
2=Observing/interacting with group/individual
3=Observing activity but not interacting
4=In room/office but not observing/interacting
5=Not in room at all

[3] With-it-ness:
1=Sensitive to all/sensitive at many levels
2=Sensitive to most needs
3=So-so/variable sensitivity to needs
4=Not sensitive to most students
5=Not sensitive at all

[4] Group:
1=Students in more than one room working on various tasks
2=Students in one room working on various tasks
3=Students in more than one room working on same task
4=Students in one room working on same task

TABLE 35

PROFILE OF ALL POSTSECONDARY BUSINESS AND OFFICE CLASSES: TEACHER METHOD, ROLE, WITH-IT-NESS BY STUDENT TIME AND GROUPING

Teacher Method	Total Minutes on Method	Percent of Student Time[1]				Dominant Teacher Role[2]	Dominant Teacher With-it-ness[3]	Dominant Student Group[4]
		Theory	Practice	Non-Content	Off Task			
1. One-to-one instruction	852	14.9	63.1	11.9	9.9	2	1	4
2. Discussion/questions and answers	107	55.5	28.5	6.9	9.0	1	1	4
3. Socialize	29	14.6	24.5	12.2	48.7	2	2	4
4. Lecture/audio visual	106	96.6	2.1	.8	.5	1	1	4
5. Announce/pass materials	76	36.5	28.2	19.5	15.6	1	1,2	4
6. Clean up/set up	13	1.5	39.9	9.4	49.2	4	3	4
7. Explain directions/demonstrate	618	39.9	44.7	11.1	4.3	2	1	4
8. Test/inspect work	40	44.4	49.3	5.9	.4	3,1	1	4
9. Observe	168	8.8	74.1	12.1	5.1	3	1	4
10. Work on own/paperwork	330	8.6	76.7	8.6	6.1	4	3	4
11. Other/break/out of room	613	8.1	44.4	11.7	8.9	4,5	5	4
Total minutes observed 2952								

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[1] Rows do not add to 100 percent because time on break is not included in this analysis

[2] Role:
1=Observing all/interacting with all students
2=Observing/interacting with group/individual
3=Observing activity but not interacting
4=In room/office but not observing/interacting
5=Not in room at all

[3] With-it-ness:
1=Sensitive to all/sensitive at many levels
2=Sensitive to most needs
3=So-so/variable sensitivity to needs
4=Not sensitive to most students
5=Not sensitive at all

[4] Group:
1=Students in more than one room working on various tasks
2=Students in one room working on various tasks
3=Students in more than one room working on same task
4=Students in one room working on same task

TABLE 36

PROFILE OF ALL POSTSECONDARY TECHNICAL CLASSES: TEACHER METHOD, ROLE, WITH-IT-NESS BY STUDENT TIME AND GROUPING

Teacher Method	Total Minutes on Method	Percent of Student Time[1] Theory	Practice	Non-Content	Off Task	Dominant Teacher Role[2]	Dominant Teacher With-it-ness[3]	Dominant Student Group[4]
1. One-to-one instruction	338	32.5	39.8	11.9	13.0	2	1	2
2. Discussion/questions and answers	228	59.7	17.5	8.6	13.7	2	1	1
3. Socialize	27	13.7	12.7	25.4	48.2	2	3	2
4. Lecture/audio visual	59	91.8	3.4	1.2	3.7	1	1	4
5. Announce/pass materials	45	29.5	2.9	41.0	25.1	1	1	4
6. Clean up/set up	56	39.9	35.9	16.1	8.1	4	2	4
7. Explain directions/demonstrate	443	72.3	16.4	3.9	6.1	1	1	4
8. Test/inspect work	61	89.2	6.6	2.4	1.8	3	2,3	4
9. Observe	72	33.8	39.5	11.6	14.8	3	2	2
10. Work on own/paperwork	150	40.7	33.0	4.7	21.1	4	2,3	2
11. Other/break/out of room	275	19.4	22.7	6.2	9.1	5	5	2
Total minutes observed 1754								

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[1] Rows do not add to 100 percent because time on break is not included in this analysis

[2] Role:
1=Observing all/interacting with all students
2=Observing/interacting with group/individual
3=Observing activity but not interacting
4=In room/office but not observing/interacting
5=Not in room at all

[3] With-it-ness:
1=Sensitive to all/sensitive at many levels
2=Sensitive to most needs
3=So-so/variable sensitivity to needs
4=Not sensitive to most students
5=Not sensitive at all

[4] Group:
1=Students in more than one room working on various tasks
2=Students in one room working on various tasks
3=Students in more than one room working on same task
4=Students in one room working on same task

TABLE 37

PROFILE OF ALL POSTSECONDARY TRADE AND INDUSTRIAL CLASSES: TEACHER METHOD, ROLE, WITH-IT-NESS BY STUDENT TIME AND GROUPING

Teacher Method	Total Minutes on Method	Percent of Student Time[1] Theory	Practice	Non-Content	Off Task	Dominant Teacher Role[2]	Dominant Teacher With-it-ness[3]	Dominant Student Group[4]
1. One-to-one instruction	295	23.4	46.3	19.8	10.5	2	3	2
2. Discussion/questions and answers	15	21.8	53.9	19.0	5.4	2	2	2
3. Socialize	0	0.0	0.0	0.0	0.0	n/a	n/a	n/a
4. Lecture/audio visual	0	0.0	0.0	0.0	0.0	n/a	n/a	n/a
5. Announce/pass materials	0	0.0	0.0	0.0	0.0	n/a	n/a	n/a
6. Clean up/set up	1	0.0	0.0	100.0	0.0	3	3	2
7. Explain directions/demonstrate	241	20.1	47.9	19.7	12.3	2	1	2
8. Test/inspect work	0	0.0	0.0	0.0	0.0	n/a	n/a	n/a
9. Observe	84	14.4	14.9	58.4	17.3	3	3,4	2
10. Work on own/paperwork	58	8.4	20.2	47.6	23.8	4	3	2
11. Other/break/out of room	116	17.2	12.8	10.3	7.2	4	4,5	2
Total minutes observed 810								

[1] Rows do not add to 100 percent because time on break is not included in this analysis

[2] Role:
1=Observing all/interacting with all students
2=Observing/interacting with group/individual
3=Observing activity but not interacting
4=In room/office but not observing/interacting
5=Not in room at all

[3] With-it-ness:
1=Sensitive to all/sensitive at many levels
2=Sensitive to most needs
3=So-so/variable sensitivity to needs
4=Not sensitive to most students
5=Not sensitive at all

[4] Group:
1=Students in more than one room working on various tasks
2=Students in one room working on various tasks
3=Students in more than one room working on same task
4=Students in one room working on same task

CHAPTER 5

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

Summary of Findings and Conclusions

The purpose of this exploratory study was to determine the relationship of teacher and classroom variables to student time on task in vocational classes. A corollary purpose was to develop an observation guide for ascertaining vocational student time use, teacher behaviors, and classroom variables. A number of variables were observed and recorded, both on a minute-by-minute basis and in narrative fashion in purposively selected secondary and postsecondary vocational classes. The results of statistical and qualitative analysis indicated that teacher behaviors and classroom variables influence student time on task, and that different variables are associated more with time on practice than with time on theory in vocational classrooms.

In chapter 4, the findings and conclusions were presented separately for secondary and postsecondary classes. Secondary school attendance is compulsory whereas postsecondary-level enrollment is voluntary. Although a major responsibility of secondary teachers is to keep track of students, many postsecondary teachers do not even take roll, making students completely responsible for their own attendance. In several postsecondary classes, students stayed in class only long enough to complete their individual goals for the day. Consequently, their time in the class was spent productively with little time off task.

It is not surprising, therefore, to find that postsecondary classes had more time on task (83.5 percent) than secondary classes (71.4 percent). Also, since student maturity and motivation probably accounted for much of the time on task, there was a relatively narrow range (76.4 to 96.1 percent) of time on task among the sixteen postsecondary classes. There was a much wider range for the nine secondary classes (44.8 to 95.9 percent), which provided more opportunities to associate teacher and classroom variables with student time on task. Therefore, the relationships in the secondary data are more evident. Although the postsecondary findings provided valuable insights about maximizing time on task, the secondary findings were stronger. The following variables were observed and analyzed for their association with secondary and postsecondary student time on task:

- Teacher goal definition
  analyzed qualitatively

- Teacher planning/organization
  analyzed qualitatively

- Teacher methods
  eleven methods or groups of methods analyzed statistically

- Teacher with-it-ness
  level of sensitivity to students' needs analyzed statistically

- Teacher maximizing time
  analyzed qualitatively

- Teacher role
  type of interaction and observation of students analyzed statistically

- Teacher modeling work ethic
  analyzed qualitatively

- Teacher positive reinforcement/expectations
  analyzed qualitatively

- Teacher content knowledge/skill
  analyzed qualitatively

- Student grouping
  whether students in one or more rooms and doing one or more types of tasks analyzed statistically

- Interruptions and disruptions
  distractions from outside and inside class analyzed statistically

Summary of Secondary Classes

The proportions of time spent by secondary students in nine classes during 5,938 minutes of observation were as follows:

Basic skills	2.8	Time on task 71.4%
Employability skills	.7%	
Theory	21.3%	
Practice	37.8%	
Noncontent	8.5%	
Break	4.5%	Time off task 29.6
Time off task	24.1%	

There were considerable variations in the time spent among the three service areas--agriculture, business and office, and trade and industrial--and among the individual classes. Time on theory ranged from 1 percent to 54 percent whereas time on practice ranged from 1 percent to 68 percent. Although four classes spent no time on basic skills, one class spent almost 11 percent time on that task. The range for employability skills was 0 to 4 percent. The low for noncontent was 5 percent and the high was almost 14 percent. Three classes spent no time on breaks, whereas one class spent 9 percent of the time on breaks. Finally, time off task ranged from 7 percent to 49 percent.

In general, in secondary classes, the most important teacher behavior was goal definition. Teachers that clearly stated the goals to be accomplished by the class and by individuals had the highest proportion of time on task. This teacher variable was related closely to another: teacher planning and organization. Teachers who clearly communicated the goals to students, by talking about them or writing them on chalkboards or posting them on bulletin boards, were also better prepared to have goals accomplished. They had the necessary supplies, tools, and equipment on hand, ready to be used. It was also important that teachers were aware that time should be used productively, and were tuned into their students needs' (teacher with-it-ness) so that students were not kept waiting but could proceed to the next task.

About a third of the time the teachers used the one-to-one method of instruction, which, in some cases, was conducive to time on task. Several of the teachers were able to have a high degree of sensitivity to all or most students' needs (teacher with-it-ness) even when they worked with one student. Others could not concentrate on more than one activity with the result that when these teachers provided one-to-one instruction, most of the other students were off task. Secondary students required close supervision through interaction and observation (teacher role), but the type of supervision depended upon student grouping and the type of tasks being performed by the students. When students were practicing in more than one room, for example, the best teacher role appeared to be interaction with and observation of a small group or individuals.

Overall, the teacher method that least facilitated student time on task was cleaning up or setting up. Teacher methods most conducive to student time on task (in addition to one-to-one instruction) were observation, test/inspect work in progress, and explain/give directions/demonstrate. Additional teacher variables that appeared to be positively associated with students' time on task were the teacher's modeling of the work ethic, positive reinforcement and expectations of students, and teacher content knowledge and skill proficiency.

Student grouping was the most important classroom variable because it dictated to some degree, the type of teacher inter action and observation necessary. Although interruptions and disruptions distracted individual students from their tasks, for the most part these variables were not strongly associated with time off task in the secondary vocational classes observed.

Summary of Postsecondary Classes

The proportions of time spent by postsecondary students in sixteen classes during 5,915 minutes of observation were as follows:

Basic skills	.3%	Time on task	83.5%
Employability skills	1.6%		
Theory	42.3%		
Practice	27.9%		
Noncontent	11.4%		
Break	7.3%	Time off task	16.5%
Time off task	9.2%		

There was less of a range of time on task (78.1 to 90.3 percent) among postsecondary service areas than among secondary service areas. There were no classes with very low time on task. The lowest was 77.6 percent and the highest was 96.1 percent. There was considerably more variation among classes regarding specific uses of time. Time on theory ranged between 10.4 percent in a word processing class to 73.9 percent in an air conditioning fundamentals class. Conversely, the highest time for practice was in that word processing class (72.1 percent), whereas the lowest was in the other air conditioning fundamentals class (0.0 percent). Only four classes spent any time on basic skills, whereas all but four spent time on employability skills. Time for noncontent ranged between 2.9 to 18.0 percent. Five classes had no time for breaks at all. The highest time off task was in the air conditioning class (20.5 percent) and the lowest was in a beginning typing class (2.1 percent).

Although there were no postsecondary classes that had extreme amounts of time off task, there were differences observed in teacher behaviors that appeared to relate positively or negatively to student time on task. As in the secondary classes, in postsecondary classes where teachers clearly defined the goals for the class or individuals, there was a higher proportion of time on task. In fact, the observers felt that once students acknowledged the goals, in some classes it made no difference whether the teacher remained in the classroom or not. Teacher planning and organization was a corollary to goal setting that made a difference in time on task, although it was not as critical as in the secondary classes since postsecondary students frequently brought their own supplies and tools to class. Postsecondary teachers appeared to maximize the time available with a sense of urgency that may have reflected their understanding that many students had jobs and family responsibilities. Many students came to class to accomplish their goals for the day and then left before class was officially finished.

In classes where teachers engaged the students in discussions or explained and demonstrated skills, or varied their teaching methods in other ways, there was a greater amount of time on task than in classes where teachers always left students alone. This does not contradict the earlier statement that teachers should leave postsecondary students alone sometimes to increase time on task. Teachers' sensitivity to student needs at the moment, or teacher with-it-ness, was critical to their recognizing when students had sufficient information to proceed on their own and when discussions or further explanations were necessary. Some teachers explained too much and interrupted students who were able to proceed on their own, and some teachers socialized with students while others were trying to work.

The part-time postsecondary teachers appeared to be more enthusiastic about teaching than some of the full-time teachers. The part-time teachers appeared to use far more world-of-work examples in explanations. Most of the teachers, whether full-time or part-time, seemed to model the work ethic with their professional manner and dress, although there were exceptions. The observers noted that the teachers' professionalism, combined with genuine interest in the students, seemed to motivate students to work harder to win the teachers' respect.

As in secondary classes, postsecondary teachers who provided positive reinforcement and had positive expectations of students had the higher time on task classes. Although postsecondary students were more mature and more internally motivated than secondary students, they too needed to be recognized as individuals and to be praised for accomplishments.

Implications and Recommendations for Vocational Educators

Several issues have emerged from this exploratory study that have significant policy implications for vocational educators, especially teacher educators, teacher evaluators, supervisors, and policymakers. Most of the issues affect the secondary level, although some also affect the postsecondary level. It is most important to recognize that the postsecondary students' maturity and motivation to be in school are significant factors in their being on task a greater proportion of time than secondary students. Nonetheless, postsecondary teachers can and should improve their approach to increasing student time on task, because in some classes students do not maximize the time available. To increase time on task, secondary and postsecondary teachers should--

- consider time an important resource,
- ensure that students' tasks are meaningful,
- define goals clearly,

- improve and diversify teaching methods,
- decrease time for breaks,
- decrease interruptions of individual students,
- encourage student independence,
- have positive expectations of students,
- provide positive reinforcement, and
- serve as a role model.

Consider Time a Resource

The most important issue that concerns both the secondary and postsecondary levels is the lack of teacher awareness of the importance of time as a valuable resource. Time is one of the few variables that teachers can manipulate in the classroom. Some teachers in the study used time far more efficiently than others and were concerned that students lean as much as possible during the time. Some teachers filled the time by keeping students busy as opposed to helping them progress through a series of related meaningful tasks, although this was far more apparent in the secondary classes than the postsecondary classes.

Many of these teachers did not try to maximize the class time by starting as soon as the bell rang and often allotted overly long periods for setting up and cleaning up. If teachers were more aware of time they would, for example, assign students tasks as soon as the bell rings instead of waiting to start class when all the buses arrive. This would save many minutes of time. In a class with fifteen students, a teacher who waits ten minutes a day for the last five students to arrive loses an astounding eighteen thousand minutes or three hundred student hours of class time during a 180-day school year.*

Similar losses of time occur when some teachers have all students clean up for twenty to thirty minutes at the end of class time. Even the messiest rooms do not require that all students clean up for that much time. In a class with fifteen students, any more than fifteen minutes is wasted time that can result in from 225 to 675 student hours lost during a school year. Although there was less time wasted in postsecondary classes than in the secondary classes, it appeared that some teachers were not overtly encouraging students to maximize their time. Instead, much of the efficient time utilization was due to postsecondary student motivation to complete tasks as soon as possible and then leave, even when class was not officially over.

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*Calculated by multiplying the ten students in the class by ten minutes a day by 180 days of the school year.

It appears that if teachers would be trained to regard time as a resource that should be used as carefully as supplies or other consumables, then students would spend more time on meaningful tasks. Further, if use of time were an evaluative criterion, then supervisors and evaluators could recommend that teachers look at how time is used in their classes and make necessary changes.

Assure that Tasks Are Meaningful

Another important issue arising from this study is that although "time on task" implies that students are learning or increasing their skills, the actual amount of achievement cannot be measured through observation alone, especially at the secondary level. In some instances the observers felt that students were assigned routine, repetitious, and nonmeaningful tasks just to keep them busy. Obviously there are many jobs in the real world of work that are repetitious and routine, but the function of vocational education is to teach as many skills as efficiently as possible. Even in cases where teachers assigned meaningful tasks, some students did the easiest or least messy tasks for long periods of time. Because they were not disturbing others and appeared "busy," the teachers left them alone.

It is, therefore, imperative that if evaluators or supervisors use time on task as a criterion of effective teaching, they must look beyond the number of students that are "busy" to record the number that are engaged in meaningful tasks. Teachers likewise should not just see that their students are occupied with tasks, but that these tasks are relevant to the achievement of stated educational objectives. Obviously, the term "meaningful" tasks is a highly objective one and its interpretation could be fiercely debated. It must, therefore, be carefully defined by teachers and their supervisors. Perhaps self-analysis of their students' tasks by teachers would be more helpful than the imposition of supervisors' opinions.

Define Goals Clearly

Time on task, especially on meaningful tasks, was very complex to assess because so many variables were involved. Throughout the observations, however, the most critical factor appeared to be whether or not the teacher clearly defined goals for the class and for individuals. The teachers' methods, style of interaction (role) and sensitivity to students' needs (with-it-ness) were also important, of course, but were secondary to the definition of goals. If teachers learned to tell students their expectations for the class period, the week, the grading period, and the whole year, then more students would be engaged in meaningful tasks for longer periods of time. In classes where teachers were explicit about goals, students stayed on task more because they had less "down time" waiting for further instructions. Much time was wasted at the secondary level when students did not know how to proceed on their own and had to wait their turn for one-to-one instruction. Since secondary teachers used one-to-one instruction about a third of the time, it is important that they provide students more long-range instructions rather than giving them tasks that need step-by-step prompting. Supervisors and evaluators should tell teachers who exhaust themselves by running from student to student that perhaps the students do not understand the long-range goals of the tasks they are asked to accomplish. Evaluative criteria should include noting whether instructions and goals are explained orally as well as written on the chalkboard or posted on a job board.

Improve Teaching Methods

Along with clarifying goals, teachers must use appropriate methods to teach the content they appear to know well. Most of the teachers in the study were proficient in their subject area but did not always use the appropriate teaching methods. Several secondary teachers had a great deal of student time off task because they did not explain or demonstrate the tasks sufficiently to all the students. Instead, they showed students each step individually as they needed it. Although much of this was due to the individually paced, competency-based curricula, the observers believed that teachers could nonetheless provide better overviews and opportunities to learn generic skills. Very few teachers at the secondary level used audiovisual aids, lectured, provided explanations, or skills to give students the big picture of why their task or skill practice was important. At the postsecondary level, more teachers provided such overviews, which appeared to make a difference to a time on task in their classes compared to those who did not provide the overviews. Several teachers explained to the observers that most explanations, lecture, and demonstrations are given at the beginning of the school year (as opposed to March and April when the study was conducted). If that is the case, then teachers should change the timing of their explanations or repeat them when the students are about to start practicing the related skills. At both levels, teachers used a very narrow range of methods to teach and did not use the most appropriate method for the given task. Observers noted no peer-led discussions or demonstrations, no guest speakers, no field trips, and few audiovisual aids. In classes where teachers kept a faster pace and varied their methods, students responded by working faster, accomplishing more, and staying on task for a greater proportion of the available time. Teachers should have opportunities to see other teachers who have high time-on-task classes in action and should be encouraged to experiment with a wider range of teaching methods.

Decrease Time for Breaks

Scheduled or mandatory breaks are a deterrent to time on task. In most classes where students took breaks as they needed them, there was less overall time off task. In many classes teachers would announce breaks that interrupted many students concentrating on tasks. In some classes, students continued to work through the break times when teachers permitted them to do so, but several teachers turned off the electricity or otherwise stopped the work so that they could leave for a break themselves. Perhaps having breaks in secondary classes is due to state laws, but mandatory breaks should be eliminated in postsecondary classes, especially when students could continue to work safely on their own. Postsecondary students would use the time better if allowed to work, and would take breaks as needed. Furthermore, the psychological break that comes from shutting down the whole class makes it difficult to regain the momentum of working. Students in the study were frequently off task a greater proportion of the time after a break than prior to the break.

Decrease Interruptions

Interruptions such as public address announcements were not observed to be a major deterrent to whole class time on task. However, especially at the secondary level, interruptions such as students from another class coming in to chat did keep the involved individuals off task. In the statistical analysis, interruptions did not show a significant effect on time on task, but when analyzed qualitatively, it appeared that the interruptions of individuals disrupted their time on task considerably. Teachers who kept other students out of the classroom by closing and even locking doors prevented the types of interruptions that kept some students off task for several minutes each time.

Encourage Student Independence

Another subtle but important issue is that of teacher control and resultant student dependence or independence. This issue is tied to the issue of clarifying goals but is different enough to warrant a separate discussion. Although it is not an important issue in postsecondary classes, in secondary classes in the study, teachers often did not encourge students to try tasks on their own or to experiment. Where students were trusted to be more independent, they accomplished more. The adage "teach them to fish rather than giving them the fish" aptly portrays what happens in some classes where teachers encourage student independence. When teachers encourage students to learn on their own and provide them sufficient basic understanding of the skills, students do not have to spend as much time waiting for one-to-one instructions. Students are more in charge of their time and, although there are exceptions, can proceed to accomplish tasks, explore alternative ways to do tasks, and feel that they know what to do.

Teachers should be encouraged to assess how their means of controlling their students may or may not impede their independence. Although secondary teachers should not abdicate control of the classes, they can teach students to be more independent of continual teacher supervision. This is especially true when students are grouped in several rooms.

Have Positive Expectations and Provide Positive Reinforcement

Because it has been repeated so often, the notion of having positive expectations of students is sometimes overlooked. Especially at the secondary level, a few teachers appeared to believe their students could not work on their own and could not work well regardless of the instructions they received. Even teachers who were not so negative did not appear to have high expectations of their secondary students. However, teachers who did appear to believe students could "do it" provided students with enough instructions so they could proceed on their own. In those classes, students were on task more often, regardless of whether or not the teacher was supervising them closely.

This issue is closely tied to providing positive reinforcement. Teachers who had positive expectations also seemed to praise students more often for accomplishing goals. There appeared to be a higher level of motivation, urgency to work, and tendency to stay on task in both the secondary and the postsecondary classes observed where teachers told students they were doing well.

Serve as Role Model

A final issue is teachers serving as the students' role models. Teachers who were professional in demeanor had classes with greater proportions of time on task than teachers who were "buddies" or who frequently socialized. At both levels, students worked harder if they appeared to respect their teachers as exemplary workers in the professions they themselves aspired to enter. Teachers should not only act professionally, they should also tie the class work to world-of-work examples. They should let students know about their own world of work experiences so that students can be better prepared to make career decisions and to have realistic expectations about working. Teacher educators and supervisors should stress the importance of being a role model when teaching secondary and postsecondary vocational education classes.

Recommendations for Further Research

It is important to keep in mind that this was an exploratory study. More research is needed to confirm the conclusions and to expand the scope of this study. Further research is needed within each service area to discern which teaching behaviors produce the highest proportions of time on task. Teacher educators are not satisfied with findings collapsed from various service areas. They want recommendations that apply to their service area and especially to their specialty within the service area.

Achievement in vocational education classes should be studied relative to student time on task, student grouping, and teacher behaviors. Due to contract restrictions, no attempt was made in this study or the previous study to relate achievement of certain levels of occupational competency to the proportion of time spent on technical skills. Until such research is done, there will be no conclusive evidence that time on task is as important a factor in vocational classes as it is in academic classes.

It is also recommended that teacher educators and researchers work together to determine how future teachers can be better trained to maximize time in their classes. Collaboration between teacher educators and researchers is necessary in order to ensure that the researchers are providing useful information that teacher educators can use for training students to be better teachers.

Another recommendation is that the methodology of this study be used to develop criteria to evaluate the efficiency of vocational education classes. Time on task should also be used as a criterion for the evaluation of teachers. Obviously, if students are off task a large proportion of the available time, they cannot be learning or improving their skills. Levels of acceptable time on and off task must be determined at the local level for specific classes or service areas and then used to assess student productivity.

Finally, it is important to remember that time on task is critical because it is one of few variables affecting student achievement that can be manipulated by teachers. It is, therefore, recommended that research on various aspects of student time on task be continued so that the database about time on task will grow not only in quantity, but also in sophistication and usefulness to vocational educators at the secondary and postsecondary levels.

APPENDIX

OBSERVATION GUIDES

Observation Guide I

CODES

● **Student Deployment**
In one room 1
In two/more contig. rooms 2
In two/more noncontig. rooms 3
Away from school (e.g., field trip) 4
Other ______________ 5

● **Student Grouping**
Entire class 1
Mainly small groups 2
Mainly individuals 3
Combined small groups and individuals 4
Other ______________ 5

● **TEACHER**
(Opportunity to view students)
See all students at a glance from one location 1
Easily see all students by walking around 2
Difficult but possible to see all students by walking around 3
No way to see all students even by walking around 4
Teacher not in class—no one in charge 5
Not applicable 6

● **TEACHER**
(Opportunity to interact with students) 1
Interact with all students within one room location 2
Easily interact with all students by walking around room/locations 3
No way to interact with all students even by walking around 4
Teacher not with students no one in charge 5
Not applicable 6

● **TEACHER ROLE**
Observing all/interacting with all students in class 1
Observing and interacting with group/individual 2
Observing activity but not interacting (monitoring) 3
In room/office but not observing or interacting 4
Not in room at all 5

● **TEACHER TASK**
(Purpose of teacher's behavior)
Clarify goals 01
Present new condition 02
Review old condition 03
Provide for practice 04
Monitor, assess progress 05
Provide feedback 06
Correct poor learning 07
Clarify roles 08
Maintain activity flow 09
Discipline inappropriate behavior 10
Managerial/housekeeping tasks 11
Maintaining harmonious relationships with students 12
Teacher off task/inappropriate task 13
Other ______________ 14
Can't code, can't decide 15

● **TEACHER METHOD**
(Primary mode at this minute)
One to one instruction 01
Question/answer 02
Discussing 03
Socializing 04
Lecture 05
Make announcements 06
Give directions/instructions 07
Demonstrate/explain 08
Use audio-visuals 09
Test/quiz (written) 10
Inspect work in progress 11
Observe students practicing 12
Work on own (paperwork project) 13
Pass out materials 14
Help clean up, set up 15
Other ______________ 16

	Identification Codes										Class		Teacher					Students Time on Task/Content						Students Time on Task/Non-Content							Students Time Off Task					Student Numbers		NOTES
	Time	Date Mo	Day	Observer	Site	Level	School	Service Area	Class	Teacher Type	Deployment	Grouping	Opp. to View	Opp. to Interact	Role	Task (Purpose)	Method (Primary Mode)	Basic Skills (Read, Write, Compute)	Technical Skills/Theory	Technical Skills/Practice	Employability Skills	Youth Organization Activities	Other on Task/Content	Youth Organization Activities	Assigned But Non-Content	Set Up/Clean Up	Out of Room (Tutoring, etc.)	Scheduled/Mand. Breaks	Transitional (Move Room to Room)	Other on Task/Non-Content	Wait; Nothing	Socialize; Mild Goof; Not Others	Goof Off; Warrants Discipline	Restroom; Leave Room	Other Time Off Task	Students Enrolled	Students Present	
1	:																																					
2	:																																					
3	:																																					
4	:																																					
5	:																																					
6	:																																					
7	:																																					
8	:																																					
9	:																																					
10	:																																					
11	:																																					
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13	:																																					
14	:																																					
15	:																																					

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66

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Observation Guide II

CODES

- **Student Involvement**

All highly involved	1
Many highly involved	2
Mixed-some high, some low involvement	3
Many not highly involved	4
None highly involved	5

- **Teacher Withitness**

Sensitive to all—sensitive at many levels	1
Sensitive to most needs	2
So-so; variable sensitivity to needs	3
Not sensitive to most students	4
Not sensitive at all	5

__________ 01
__________ 02
__________ 03
__________ 04
__________ 05
__________ 06
__________ 07
__________ 08
__________ 09
__________ 10
__________ 11
__________ 12

NARRATIVE:

- How is teacher maintaining activity flow?
- Is teacher behavior appropriate; on task?
- What appear to be controls/standards for student behavior?
- What behavior setting/content variables seem to influence time on task?

	Time	Date		Observer	Site	Level	School	Service Area	Class	Teacher Type	Disruption (Internal)	Interruption (External)	Transitions	Students Involvement	Teacher Withitness	Code
		Mo	Day													
1	:															
2	:															
3	:															
4	:															
5	:															
	1 2 3 4	5 6	7 8	9	10	11	12 13	14	15 16	17	18	19	20	21	22	23 24

ADDITIONAL NOTES:

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REFERENCES

Anderson, L. W. "Student Involvement in Learning and School Achievement." *California Journal of Educational Research* 26 (March 1975): 53-62.

Anderson, L. W., and Scott, C.C. "The Relationship among Teaching Methods, Student Characteristics, and Student Involvement in Learning." *Journal of Teacher Education*, 29, no. 3 (May-June, 1978): 52-57.

Atkinson, R. C. "Computer-Based Instruction in Initial Reading." In *Proceedings of the 1967 Invitational Conference on Testing Problems*. Princeton, NJ: Educational Testing Service, 1968.

Barnes, Susan. *Synthesis of Selected Research on Teaching Findings*. Report no. 9009. Austin, TX: Research and Development Center for Teacher Education, University of Texas at Austin, September 1981.

Block, J. H., ed. *Mastery Learning: Theory and Practice*. New York: Holt, Rinehart and Winston, 1971.

Bloom, B. S. "Time and Learning." *American Psychologist* 29 (1974): 682-688 reprinted in *Learning and Instruction*, edited by M.C. Wittrock. Berkeley: McCutchan, 1977.

Blume, C. E. "Techniques in the Measuring of Pupil Attention." In *The National Conference of Supervisors and Directors of Instruction, Second Yearbook*. New York: Bureau of Publications, Teachers College, Columbia University, 1929.

Borg, W. R. "Time and School Learning." In *Time to Learn*, edited by Carolyn Denham and Ann Lieberman. Washington, DC: National Institute of Education, 1980.

Brady, M. E.; Clinton, D.; Sweeney, J. M.; Peterson, M.; and Payner, H. *Instructional Dimensions Study*. Washington, DC: Kirschner Associates, 1977.

Brown, R. *Training of Teachers Using Observation of BTES Variables*. Washington, DC: National Institute of Education, 1979. (ERIC No. ED 196 900)

Burnham, L. "Teacher Traits That Facilitate Adult Learning." *The Education Digest* 48, no. 7 (March 1983): 32-35.

Caldwell, J. H.; Huitt, W. G.; and Graeber, A. O. "Time Spent in Learning: Implications from Research." *Elementary School Journal* 82, no. 5 (1982): 471-480.

Carroll, J. B. "A Model of School Learning." Teachers College Record 64 (1963): 723-733.

Carroll, J. B. "A Revisionist Model of School Learning." Review of Education 3 (1977): 155-167.

Cobb, J. "Relationship of Discrete Classroom Behaviors to Fourth Grade Academic Achievement." Journal of Educational Psychology 63, no. 1 (February 1972): 74-80.

Coleman, J. S., et al. Equality of Educational Opportunity. Washington, DC: Government Printing Office, 1966.

Cornbleth, C., and Korth, W. "Instructional, Context, and Individual Differences in Pupil Involvement in Learning Activity." Paper presented in San Francisco at the 1979 American Education Research Association annual conference.

Cusick, P. A. Inside High School. New York: Holt, Rinehart and Winston, 1973.

Edminston, R. W., and Braddock, R. W. "Study of the Effect of Various Teaching Procedures upon Observed Group Attention in the Secondary School." Journal of Educational Psychology 32 (December 1941): 665-672.

Edmonds, R. R. "Effective Schools for the Urban Poor." Educational Leadership 37, no. 1 (1979): 15-27.

Edwards, Sara. Changing Teacher Practice: A Synthesis of Relevant Research. Austin, TX: Research and Development Center for Teacher Education, University of Texas, 1981.

Evertson, C. "Differences in Instructional Activities in High and Low Achieving Junior High Classes." Paper presented at the annual meeting of the American Education Research Association, Boston, April 1980.

Fisher, C. W.; Filby, N. N.; Marliave, R. S.; Cahen, L. S.; Dishaw, M. M.; Moore, J. E.; and Berliner, D. C. Teaching Behaviors, Academic Learning Time and Student Achievement: Final Report of Phase III-B. Technical Report V-I. San Francisco: Far West Laboratories, 1978.

Flanders, N. A. "The Problems of Observer Training and Reliability." In Interaction Analysis: Theory, Research and Application, edited by E.J. Amidon and J.B. Hough. Reading, MA: Addison-Wesley Publishing Co., 1967.

Fox, R.; Peck, R. F.; and Blattstein, A. Tracing Teacher Effects Through Student Behavior to Learning Outcomes. Austin: Research and Development Center for Teacher Education, 1978.

Frederick, W. C. "The Use of Classroom Time in High Schools Above or Below the Median Reading Score." Urban Education 11, no. 4 (January 1977): 459-464.

Frederick, W.; Walberg, H.; Rasher, S . "Time, Teacher Comments, and Achievement in Urban High Schools." Journal of Educational Research 73, no. 2 (November-December 1979): 63-65.

Glaser, R. "Adapting the Elementary School Curriculum to Individual Performance." In Proceedings of the 1967 Invitational Conference on Testing Problems. Princeton, NJ: Educational Testing Service, 1968.

Goodlad, John I. "A Study of Schooling: Some Findings and Hypotheses." Phi Delta Kappan 64, no. 7 (March 1983): 465-470.

Goodlad, J. A Place Called School. New York: McGraw-Hill, 1983.

Goodlad, J. I.; Sirotnik, K. A.; and Overman, B. C. "An Overview of 'A Study of Schooling.'" Phi Delta Kappan 61, no. 3 (November 1979): 174-178.

Halasz, I., and Behm, K. Time on Task in Selected Vocational Education Classes. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1983.

Henderson, Janet Lee. "Time-on-Task Behavior in Selected Vocational Horticulture Laboratories." Ph.D. diss., Mississippi State University, 1983.

Huitt, W. G., and Caldwell, J. H. "Improving School Engaged Time: The RBS Approach." Time and School Learning: Theory, Research, and Practice, edited by L.W. Anderson. New York: St. Martin's Press, forthcoming.

Karweit, N. L. Time on Task: A Research Review. Report no. 332. Baltimore, MD: Center for Social Organization of Schools, The Johns Hopkins University, January 1983.

Karweit, N. L. Rainy Days and Mondays: An Analysis of Factors Related to Absence from School. Report no. 162. Baltimore: Center for Social Organization of Schools, 1973.

Kazanas, H. C. "Affective Work Competencies for Vocational Education." Information Analysis Series no. 138. Columbus: ERIC Clearinghouse on Adult, Career, and Vocational Education, The National Center for Research in Vocational Education, The Ohio State University, 1978. (ERIC No. 166 420)

Kerlinger, F. N. Foundations of Behavioral Research. New York: Holt, Rinehart and Winston, 1973.

Klein, M. F.; Tyie, K. A.; and Wright, J. E. "A Study of Schooling Curriculum." Phi Delta Kappan 61, no. 4 (December 1979): 244-248.

Kounin, J. S. Discipline and Group Management in Classrooms. New York: Holt, Rinehart and Winston, 1970.

Kounin, J., and Gump, P. "Signal Systems of Lesson Settings and the Task-Related Behavior of Preschool Children." Journal of Education Psychology 66, no. 4 (1974): 554-562.

Levanto, J. "The Identification and Analyses of Factors Related to Secondary School Absenteeism." Ph.D. diss., University of Connecticut, 1973.

Lindsay, P. "The Effect of High School Size on Student Participation, Satisfaction and Attendance." Educational Evaluation and Policy Analysis 4, no. 1 (Spring 1982): 57-65.

Little, J. School Success and Staff Development in Urban Desegregated Schools. Prepared for the American Institute of Education. Boulder, CO: Center for Action Research, 1981.

Mackenzie, D. E. "Research for School Improvement: An Appraisal of Some Recent Trends." Educational Researcher 12, no. 4 (April 1983): 5-17.

McKinney, F.; Franchak, S.; Halasz, I.; Morrison, I; and McElwain, D. Factors Relating to the Job Placement of Former Secondary Vocational Education Students. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1981.

McKinney, F.; Franchak, S.; Halasz, I.; Morrison, I.; Fornash, P. Factors Relating to the Job Placement of Former Postsecondary Vocational-Technical Education Students. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1982.

Medley, D., and Mitzel, H. "Measuring Classroom Behavior by Systematic Observation." In Handbook of Research in Teaching, edited by N. Gage. Skokie, IL: Rand McNally, 1963.

National Commission on Excellence in Education. A Nation at Risk. Washington, DC: U.S. Department of Education, 1983.

Nie, N. H.; Hull, C. H.; Jenkins, J. G.; Steinbrenner, K.; and Bent, D. H. Statistical Package for the Social Sciences, 2d ed. New York: McGraw-Hill, 1975.

Peck, R. F., and Veldman, D. J. Effects of Teacher Characteristics on Cognitive and Affective Gains of Pupils. Austin: The University of Texas, 1972.

Peterson, P. A. "A Review of the Research on Mastery Learning Strategies." Unpublished manuscript. Stanford, CA: Stanford Center for Research and Development in Teaching, 1972.

Pfannensteil, Judy. Engaged Time - Presenter's Guide. Overland Park, KS: Technical Assistance Centers, RMC Research Corporation, 1982.

Ponder, G., and Hinley, R. "Classroom Management Practices in Industrial Education Laboratories: An Ecological Study." Journal of Industrial Teacher Education 19, no. 2 (1982): 27-37.

Rosenshine, B. V. "How Time Is Spent in Elementary Classrooms." Journal of Classroom Interaction 17, no. 1 (1981): 16-25.

Rutter, M.; Maughan, B.; Mortimore, P.; Ouston, J.; and Smith, A. Fifteen Thousand Hours: Secondary Schools and Their Effects on Children. Cambridge, MA: Harvard University Press, 1979.

Ryan, D. G. Characteristics of Teachers. Washington, DC: American Council on Education, 1960.

Selz, N. The Teaching of Employability Skills: Who's Responsible? Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1980.

Seymour, G. A., and Wiggins, R. A. PLOTALL, 2d edition. Akron, OH: University of Akron Computer Center, 1981.

Slavin, R., and Karweit, N. "School Organizational vs. Developmental Effects on Attendance among Young Adolescents." Paper presented at annual convention of American Psychological Association. Washington, DC, 1982.

Sirotnik, K. A. "What You See is What You Get--Consistency, Persistency, and Mediocrity in Classrooms." Harvard Educational Review 53, no. 1 (February 1983): 16-31.

Sirotnik, K. A. "The Contextual Correlates of the Relative Expenditures of Classroom Time on Instruction and Behavior: An Exploratory Study of Secondary Schools and Classes." American Education Research Journal 19, no. 2 (1982): 275-292.

Soar, R. S. "The Social Realities of Teaching." Teachers College Record 80, no. 1 (September 1978): 54-68.

Stallings, J. A. "The Importance of Multiple Data Collection Instruments When Describing the Educational Process." Presented at the American Research Association annual meeting, New York, 1977.

Stallings, J. A. "Classroom Research: Implications for Mathematics and Science Instruction." Presented at the Biological Science Curriculum Study Conference, Boulder, CO., 1980.

Stallings, J. A., and Kaskowitz, D. H. "Follow-Through Classroom Observation Evaluation 72-73." Menlo Park, CA: Stafford Research Institute, 1974.

Stallings, J. A., and Mohlman, G. C. School Policy, Leadership Style, Teacher Change, and Student Behavior in Eight Schools. Final report. Mountain View, CA: Stallings Teaching and Learning Institute, 1981.

Statistics of State School Systems and U.S. Department of Health, Education, and Welfare. Washington, DC: National Center for Education Statistics, 1978.

Weber, J. M. Interim Report: A Comparative Study of Basic Skills in Vocational Education. Columbus: The National Center for Research in Vocational Education, The Ohio State University, January 1982.

Westbrook, J. D. Considering the Research: What Makes an Effective School? Austin, TX: Southwest Educational Development Laboratory, 1982.

Wiley, D. E., and Harnischfeger, A. "Explosion of a Myth: Quantity of Schooling and Exposure to Instruction, Major Educational Vehicles." Educational Researcher 3, no. 4 (April 1974): 7-12.

Wynne, E. A., and Martens, M. Looking at Schools: Good, Bad, and Indifferent. Lexington, MA: D.C. Heath and Company, 1980.